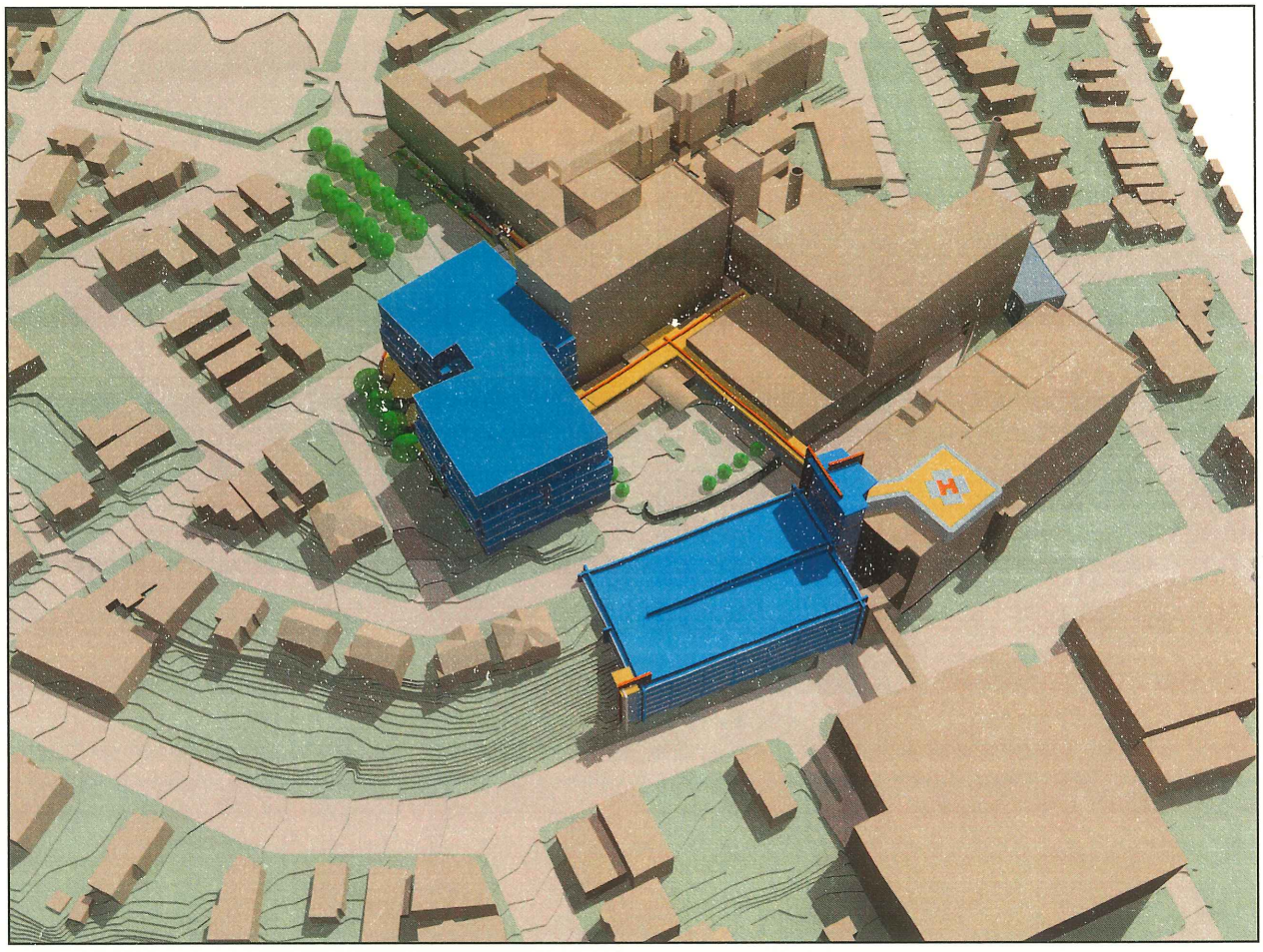
Maine Medical Center
Portland, Maine Campus
Application for Zoning Amendment
Volume 2



Site Location of Development Application

January 2004

Table of Contents

Site Location of Development Application

Maine Medical Center
Bramhall Street Campus

January 2004

Section 1

Development Description

DEVELOPMENT DESCRIPTION

A. Narrative

The Maine Medical Center Bramhall Street Campus site currently occupies approximately 12.84 acres and is bounded by Charles, Bramhall, Gilman, and Congress Streets in Portland. Existing development of the property includes various hospital buildings and associated paved parking and landscaped areas. Development of the campus has occurred throughout the years, with the last development occurring in 1996 with the redevelopment of the emergency room drop-off area. The hospital currently owns various properties surrounding the main campus; some of these properties will be impacted by the proposed expansion.

Maine Medical center is planning a comprehensive facilities construction project at its Bramhall Campus. Working closely with The Ritchie Organization, project architects, the hospital is planning the following improvements:

- A four-story, 192,000 square foot building addition for obstetrics and newborn services, referred to as the Charles Street addition. The Charles Street project also includes improvements to the Richards Wing/admitting lobby.

- A new parking garage will be located immediately east of and connected to the existing parking garage on Congress Street. A pedestrian bridge will lead from both garages to the main hospital building.

- A new central utility plant, located on Gilman Street, which will provide a central heating/cooling facility for the campus.

- A new helicopter landing pad to be constructed on the top level of the existing parking garage on Congress Street.

- Reconfiguration of the main entrances to the hospital and lobbies.

- Replacement housing for 35 and 37 Crescent Street which must be removed in order to construct the new parking garage.

Maine Medical Center of Portland will also ask the City to discontinue portions of Charles Street and Crescent Street, and to relocate a small portion of Ellsworth Street, all as shown on the plans. A short section of Crescent Street will become a two-way street west of Wescott Street and Wescott Street will be converted to a two-way street.

B. Topographic Map

Figure 1 (enclosed) consists of the USGS Portland Quadrangle with the project site identified.

C. Construction Plan:

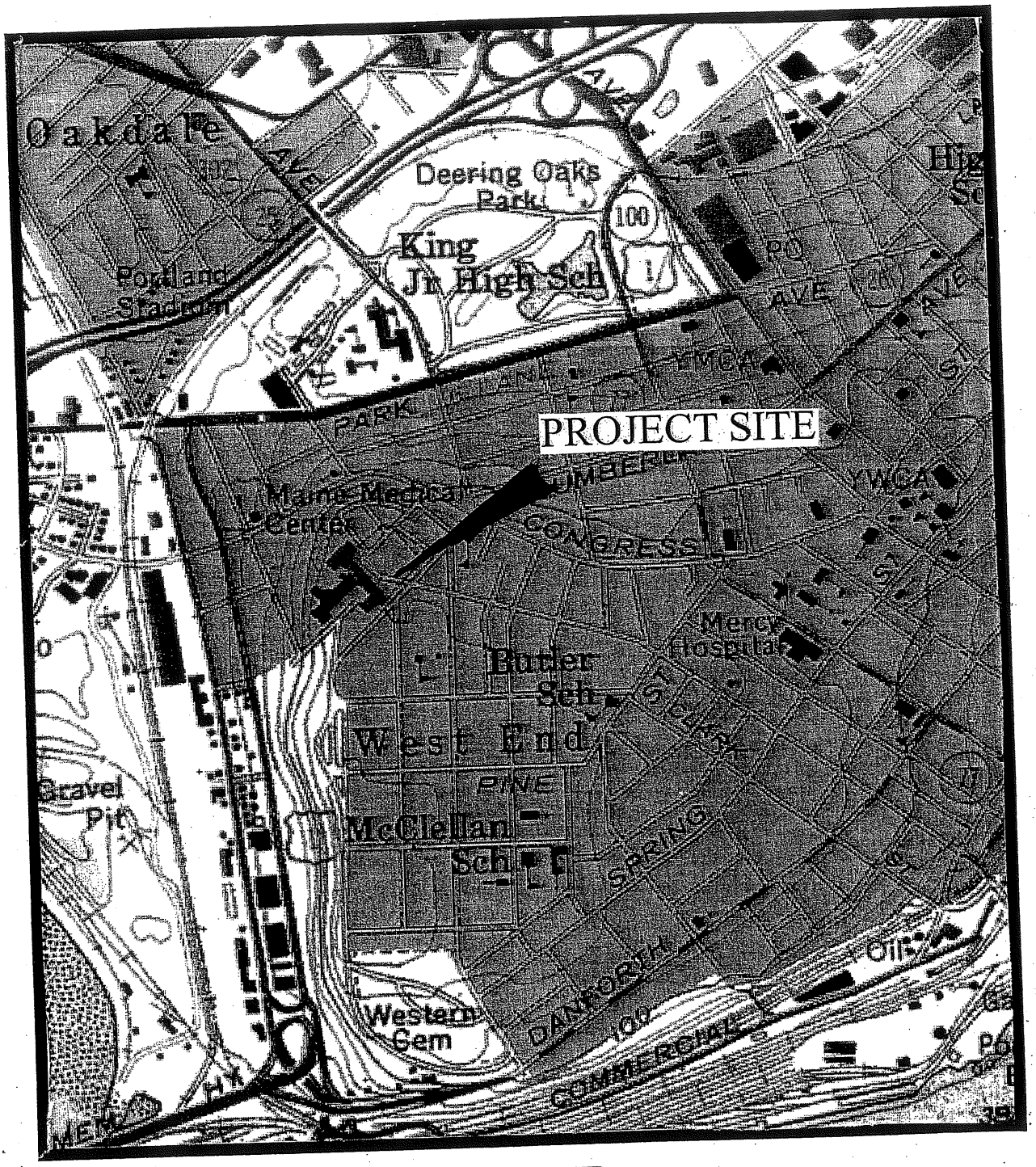
Assuming City approvals have been obtained, construction is tentatively scheduled to begin in April 2004. It is anticipated that construction will terminate in April 2007.

D. Drawings

All appropriate site drawings are submitted herewith. The sheets contain existing conditions plans, grading plans, utility plans, landscape plans, roadway plan and profiles, and construction details. Pre and Post-Development Maps are contained within the attached Stormwater Management Report.

01046

Figure 1



SITE LOCATION MAP

USGS 7.5 MIN. QUADRANGLE
PORTLAND, MAINE

Sebago Technics
Engineering & Planning for the Future

1" = 1000'

Section 2

Title, Right or Interest

Section 2

TITLE, RIGHT, or INTEREST

The following map and lot listings are part of the original Maine General Hospital, now known as Maine Medical Center. Attached are the deeds from the 1920s to the 1980s that make up these parcels.

Map	Block	Lot
53	D	7
53	D	2
53	D	1
54	H	1
64	C	1
64	C	2

In addition, the following map and lot listing are properties currently owned by Maine Medical Center that will be affected by the proposed development.

Map	Block	Lot
53	G	1
53	G	13
53	E	1
53	E	2
53	E	10
53	E	13
54	C	6
54	C	10
54	D	6
54	D	7

Easements

Two NET&T easements currently exist on Maine Medical Center property. The easements are located on Tax Map #53, Lot E-3 (Book 8573/Page 121) and Tax Map #53, Lot D-2 (Book 13027/Page 207). In addition, a right-of-way for sewer line maintenance, granted to the City of Portland (Book 1149, Page 348), exists from the intersection of Charles Street and Crescent Street and extends in a northerly direction to Congress Street.

2081

722

Know all Men by these Presents,

That ——— J. B. BROWN & SONS ———, a corporation organized and existing under the laws of the State of —— Maine ———, and located at Portland in the County of Cumberland and State of Maine

J B Brown & Sons

in consideration of one dollar and other valuable considerations, being less than $100.00 paid by —— MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine, and located at said Portland,

to

Maine Medical Center

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said —— MAINE MEDICAL CENTER, its successors and assigns forever, ——

Q C

——— All its right, title and interest in a strip of land, in the City of Portland, County of Cumberland and State of Maine, said strip being that portion of Charles Street lying between Brackett Street and Ellsworth Street bounded as follows: Beginning at a point on the southeasterly line of Ellsworth Street distant southwesterly One Hundred Sixty-three and seven tenths (163.7) feet from a point in said street line Fifty-seven (57) feet at right angles from a stone monument on three feet offset at the northwest corner of Ellsworth and Wescott Streets; thence running southeasterly making an included angle with the northwesterly direction of Ellsworth Street of One Hundred and One degrees and Twenty minutes (101° 20') a distance of One Hundred and Sixteen (116) feet, more or less, to the northerly line of Brackett Street near Arsenal Street. Said strip is Thirteen (13) feet wide and lies on the southerly side of the above described line.

To Have and to Hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MAINE MEDICAL CENTER, its successors and assigns forever.

In Witness Whereof, the said ——— J. B. BROWN & SONS ——— has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Lyman A. Cousens Jr., its Treasurer thereunto duly authorized, this 4th day of May in the year of our Lord one thousand nine hundred and —— sixty-six.

Signed, Sealed and Delivered in presence of

Ruth M. Dinan

J. B. BROWN & SONS

By Lyman A. Cousens Jr. Treas.

Philip G. Clifford Director

(Corporate Seal)

State of Maine, Cumberland ss. May 4 1966.

Personally appeared the above named Lyman A. Cousens Jr. & Philip G. Clifford

of said Grantor Corporation, as aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation.

Before me, Zillah H. Foster

NOTARY PUBLIC. ~~JUSTICE OF THE PEACE.~~

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS

Received MAY 4 1966 at 3 o'clock 17 m P M., and recorded in BOOK 2955 PAGE 722 Attest: Lucia R. Tyson Register.

2955/722

Know all Men by these Presents, That

I, Elizabeth Naylor, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable consideration, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated in said Portland, on the northerly side of Ellsworth Street and westerly side of Charles Street, bounded and described as follows: Beginning at the corner formed by the intersection of the westerly side of Charles Street and the northerly side of Ellsworth Street, and running westerly by said Ellsworth Street to land conveyed by William R. Naylor to Samuel W. Joy by deed dated November 3, 1905, and recorded in Cumberland County Registry of Deeds, Book 776, page 200; thence northerly by said Joy land to land now or formerly of Levi J. Jones; thence easterly by said Jones land to said Charles Street; thence southerly by said Charles Street to the point of beginning.

Being the same premises conveyed to William R. Naylor by John B. Brown by deed dated February 20, 1872, recorded in Cumberland County Registry of Deeds, Book 393, page 105, excepting therefrom the portion thereof conveyed by William R. Naylor to Samuel W. Joy by deed aforesaid. My title to said premises having been acquired as devisee under the will of William R. Naylor, extract from which is recorded in said Registry of Deeds, Book 783, page 307.

Also hereby conveying any right, title and interest I may have in said Ellsworth Street.

Taxes for the year 1928 are to be prorated between the grantor and grantee.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors heirs and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Elizabeth Naylor, being unmarried, have hereunto set my hand and seal this 3rd day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

Nathan W. Thompson

Elizabeth Naylor Seal

State of Maine, CUMBERLAND, ss. July 3, 1928. Personally appeared the above named Elizabeth Naylor and acknowledged the above instrument to be her free act and deed.

Nathan W. Thompson, *Justice of the Peace.*

MAP 53 BLOCK D LOT 7

1296/351

WARRANTY DEED

319

15732

Know all Men by these Presents,

That JAMES H. SULLIVAN, Jr. of 26 Charles Street, Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation with a place of business in Portland, in the County of Cumberland and State of Maine

whose mailing address is 22 Bramhall Street, Portland, Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine Medical Center, its successors heirs and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street and the southeasterly side of Congress Street, in Portland, Maine, bounded and described as follows: Beginning at a point on the southwesterly side of said Charles Street at the northerly corner of land conveyed by Edward E. Proctor to Lulu M. Stickney by warranty deed dated May 16, 1890 and recorded in the Cumberland County Registry of Deeds in Book 567, Page 348; thence running southwesterly by said Stickney land a distance of seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence running northwesterly by said Hospital land to the southeasterly side of Congress Street; thence running northeasterly by the southeasterly side of Congress Street seventy-five (75) feet, more or less, to land conveyed by Henry A. Sargent to Lucinda B. Proctor by warranty deed dated August 14, 1896, and recorded in said Registry of Deeds in Book 639, Page 284; thence running southeasterly by said Proctor land and by the southwesterly side line of said Charles Street to said Stickney land and the point of beginning.

Being the same premises conveyed to James H. Sullivan, Jr. by deed dated August 23, 1976 and recorded in said Registry of Deeds in Book 3936, Page 282.

- MAP 53 BLOCK D LOT 1 -

6177/319

320

To have and to hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine Medical Center, its successors ~~heirs~~ and assigns, to it and ~~their~~ its use and behoof forever.

And I do ~~covenant~~ with the said Grantee, its/ successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises, that they are free of all encumbrances

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall and will ~~warrant and defend~~ the same to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said James H. Sullivan, Jr. being unmarried ~~and~~ ~~husband/wife~~ ~~joining in the deed as Grantor~~ and relinquishing and conveying all rights by descent and all other rights in the above described premises, have hereunto set my hand and seal this 25th day of the month of May, A.D. 19 83.

Signed, Sealed and Delivered in presence of

James H. Sullivan, Jr.

State of Maine, County of Cumberland ss: 25 May, 19 83.

Then personally appeared the above named James H. Sullivan, Jr.

and acknowledged the foregoing instrument to be his free act and deed.

Before me,

~~Justice of the Peace~~ Notary Public ~~Attorney at Law~~

My commission expires Sept. 20, 1988

MAY 26 1983

REGISTRY OF DEEDS CUMBERLAND COUNTY, MAINE
Received at 12:01 P.M., and recorded in
BOOK 6177 PAGE 319

James J. Walsh Register

Know all Men by these Presents, That

I, Samuel W. Joy, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland, the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land, with the buildings thereon, situated on the northerly side of Ellsworth Street in said Portland, being numbered forty-three (43) on said Street, and bounded and described as follows: Beginning at a point thirty-two (32) feet westerly from the intersection of the northerly side line of said Ellsworth Street with the westerly side line of Charles Street; thence westerly by said Ellsworth Street forty-four (44) feet to the Arsenal lot, so called, now owned by the Maine General Hospital; thence northerly by said Arsenal or Hospital lot eighty-seven (87) feet to land now or formerly of Levi J. Jones; thence easterly thirty (30) feet to land now or formerly of William R. Naylor; thence southerly by said Naylor land eighty-seven (87) feet more or less to the first bound.

Being the same premises conveyed to me by William R. Naylor by deed dated November 3, 1905, recorded in Cumberland County Registry of Deeds, Book 776, page 200.

Also hereby conveying any right, title and interest I may have in and to said Ellsworth Street.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors ~~heirs~~ and assigns, to its and their use and behoof forever. And I do covenant with the said Grantee, its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Samuel W. Joy, having no wife,

have hereunto set my hand and seal this seventh day of July in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

John F. Dana

Saml W. Joy Seal

State of Maine, CUMBERLAND, ss. July 7, 1928. Personally appeared the above named Samuel W. Joy and acknowledged the above instrument to be his free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received July 7, 1928, at 10 o'clock 46 m. A. M., and recorded according to the original.

1296/352

Know all Men by these Presents, That

I, Eunice M. Chase (formerly Eunice Margaret Graham) of Portland, in the County of Cumberland and State of Maine,

in consideration of One dollar ($1.00) and other valuable considerations, paid by Maine General Hospital, a corporation organized and existing under the laws of said State of Maine, and located at said Portland,
the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maine General Hospital, its successors and assigns forever, a certain lot or parcel of land with the buildings thereon, situated on the westerly side of a thirty foot passage way leading Northerly from Ellsworth Street, in the City of Portland, State of Maine, and now known as Charles Street, and bounded and described as follows, namely;

Beginning in the westerly side line of said Charles Street at the northeasterly corner of land now or formerly of Charles A. Donnell, thence northerly, by said Charles Street, thirty feet, thence westerly, on a line parallel with the northerly line of said Donnell's land seventy-four and two-tenths (74 2/10) feet to the Arsenal Lot, so called, now owned by said Maine General Hospital; thence southerly by said Arsenal Lot, thirty feet to said Donnell's land; thence easterly by said Donnell's land seventy-four and two tenths (74 2/10) feet to the point of beginning.

Being the same premises conveyed to me under the name of Eunice Margaret Graham Chase by William Graham by warranty deed dated July 1, 1919, recorded in Cumberland Registry of Deeds, Book 1042, page 471.

Also a certain other lot or parcel of land with the buildings thereon situated in said Portland on the westerly side of Charles Street, and bounded and described as follows, to wit:

Beginning on the westerly side line of said Charles Street at a point distant seventy-three (73) feet northerly from the northeasterly corner of land now or formerly of Wiggins; thence northerly by said Charles Street forty-seven (47) feet to a stake; and from these two points extending back westerly, at right angles with said Charles Street and keeping said width of forty-seven (47) feet, about seventy-four and two-tenths (74.2) feet to the "Arsenal Lot" so called, now owned by said Maine General Hospital; and being the same premises conveyed to Mary Rich Graham, deceased, by Charles A. Donnell, by his deed dated July 1, 1893, recorded in the Cumberland Registry of Deeds, Book 604, page 124.

My title to said premises was acquired as an heir-at-law of said Mary Rich Graham, and by warranty deed from William Graham and Paul G. Graham to me under the name of Eunice Margaret Graham, dated August 2, 1912, recorded in said Registry of Deeds, Book 898, page 83.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maine General Hospital, its successors ~~heirs~~ and assigns, to its and their use and behoof forever. And I do covenant with the said grantee, its successors ~~heirs~~ and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantee, its successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Eunice M. Chase, and I, Harold B. Chase, husband of the said Eunice M. Chase joining in this deed as Grantor, and relinquishing and conveying my right by descent and all other rights in the above described premises have hereunto set our hands and seals this twentieth day of April in the year of our Lord one thousand nine hundred and twenty-eight.

Signed, Sealed and Delivered in presence of

John F. Dana to both

Eunice M. Chase Seal

Harold B. Chase Seal

State of Maine, CUMBERLAND, ss. April 20, 1928. Personally appeared the above named Eunice M. Chase and acknowledged the above instrument to be her free act and deed.

Before me, John F. Dana, *Justice of the Peace.*

Received April 20, 1928, at 10 o'clock 50 m. A. M., and recorded according to the original.

1290

192

(106)

396

Know all Men by these Presents,

That JOHN P. CONSTANTINE and CHARLENE M. CONSTANTINE, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine, and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center, its successors and assigns forever,

a certain lot or parcel of land, with the buildings thereon, situated on Charles Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on the westerly side of Charles Street at the northerly corner of land formerly owned by C. B. Saunders; thence westerly by said Saunders northerly line seventy-five (75) feet, more or less, to land of the Maine General Hospital; thence northerly by line of said Hospital land thirty-six (36) feet to a point; thence easterly on a line parallel with Saunders northerly line seventy-five (75) feet, more or less, to the westerly side line of Charles Street; thence southerly by said Charles Street thirty-six (36) feet to the point begun at.

Being the same premises conveyed to us by Frank S. Neuts, by deed dated March 2, 1967, recorded in Cumberland County Registry of Deeds in Book 2988, Page 139.

This conveyance is made subject, however, to the common passageway established by agreement between Maine General Hospital and Clarence D. Read et al, dated October 29, 1954, recorded in said Registry of Deeds in Book 2203, Page 413.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
Bureau of Taxation
1.65

3108/396

To have and to hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine Medical Center, its successors

and assigns, to its and their use and behoof forever.

And we do COVENANT with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises that they are free of all encumbrances; except as aforesaid;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will WARRANT and DEFEND the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Wherreof, we the said John P. Constantine and Charlene M. Constantine, being husband and wife,

and

have hereunto set our hands and seals this 7th day of November in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

Edward T. Jones

to both

John P. Constantine

Charlene M. Constantine

State of Maine, Cumberland } ss. 19 69.

Personally appeared the above named

John P. Constantine

and acknowledged the above instrument to be his free act and deed.

Before me,

Edward T. Jones

Justice of the Peace.

Register ~~Notary Public~~

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received NOV 7 1969 at 11 H 18 M, and recorded in BOOK 3108 PAGE 396

Linwood R. Tibbetts

22402

Know all Men by these Presents, That

229

Doak & to Maine General Hospital -- War

We, Albert E. Doak and Amelia Doak, both of Portland, County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of the State of Maine, and having its principal place of business at said Portland,

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said MAINE GENERAL HOSPITAL, its successors and assigns, forever,

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Charles Street in said Portland, bounded and described as follows: Beginning at a fence post standing on the westerly side line of Charles Street and distant northerly seventy-three and eighty-four hundredths (73.84) feet from the northwesterly corner of Ellsworth and Charles Streets; thence northerly by said Charles Street forty (40) feet to land now or formerly of Frank Abbott; thence westerly by said Abbott's land seventy-four and fifty-six hundredths (74.56) feet to land of the said grantee; thence by land of said grantee southerly forty (40) feet to land now or formerly of W. R. Naylor; thence easterly by said Naylor's land seventy-four and forty-two hundredths (74.42) feet to the point of beginning.

Being the same premises conveyed to these grantors by Henry T. Orlando by deed dated May 29, 1951, and recorded in Cumberland County Registry of Deeds in Book 2044, Page 288.

The grantee corporation herein assumes and agrees to pay the 1957 real estate taxes as part consideration for this transfer.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said MAINE GENERAL HOSPITAL, its successors and assigns, to its and its successors and assigns, to their use and behoof forever. And we do covenant with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we, the said Albert E. Doak and Amelia Doak, husband and wife, joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this third day of May in the year of our Lord one thousand nine hundred and fifty-seven.

Signed, Sealed and Delivered in presence of

Edward B Perry
E. Doak

Albert E Doak
Amelia Doak

State of Maine, Cumberland ss. May 3, 1957.

Personally appeared the above named Albert E. Doak and acknowledged the foregoing instrument to be his free act and deed.

Before me, Edward B Perry Notary Public.

STATE OF MAINE, CUMBERLAND COUNTY, SS.

Received May 3 1957 at 2 o'clock 35 m. P. M., and recorded in BOOK 2349 PAGE 229 Attest: Martha W S Staley Register-Clerk

16.05

2349/229

326

326

(106)

Know all Men by these Presents,

That I, VINCENT C. NEWTON of Portland in the County of Cumberland and State of Maine

Newton

to

Maine General Hospital

War

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE GENERAL HOSPITAL, a corporation organized and existing under the laws of Maine and located at Portland in the County of Cumberland and State of Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine General Hospital, its successors ~~heirs~~ and assigns forever,

a certain lot or parcel of land with the buildings thereon situated on the westerly side of Charles Street in said Portland, bounded and described as follows:

Beginning on the westerly side line of said Charles Street at the northeasterly corner of land formerly of John M. Jones, now of Maine General Hospital; thence running northerly by said street thirty-eight (38) feet to land formerly occupied by one Graham, now owned by Maine General Hospital; and from these two points extending back westerly at right angles from said street keeping the width of thirty-eight (38) feet and bounded southerly by said Jones land and northerly by said Graham land about seventy-four and two tenths (74.2) feet to the Arsenal Lot, so-called, now of Maine General Hospital; being the same premises conveyed to me by Charles H. Abbott et al by deed dated February 10, 1944, recorded in Cumberland County Registry of Deeds in Book 1737, Page 278.

2901/326

To Have and to Hold the aforegranted and bargained premises with all the privileges and appurtenances thereof to the said Maine General Hospital, its successors

heirs and assigns, to its and their use and behoof forever.

And I do COVENANT with the said Grantee, its successors and assigns, that I am lawfully seized in fee of the premises that they are free of all encumbrances:

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs shall its successors and will WARRANT and DEFEND the same to the said Grantee, and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I the said Vincent C. Newton, being unmarried

have hereunto set my hand and seal this 15th day of June in the year of our Lord one thousand nine hundred and sixty-five.

Signed, Sealed and Delivered in presence of

Edward J. McGoldrick

Vincent C. Newton (L.S.)

State of Maine, Cumberland } ss. June 15, 1965.

Personally appeared the above named Vincent C. Newton and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. McGoldrick
Notary Public

MY COMMISSION EXPIRES OCTOBER 6, 1971

CUMBERLAND, N.A. NOTARY PUBLIC MAINE

STATE OF MAINE

CUMBERLAND, ss. Received at 1 H 26 M P M on JUN 15 1965 REGISTRY OF DEEDS and recorded in Book 2901 Page 326

Attest: Samuel H. Tolman Register

No. 108

Know All Men by these Presents,

That I, CLARA G. READ, of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations

paid by MAINE MEDICAL CENTER, a Maine corporation having a place of business in said Portland, in said County and State,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its Successors Heirs and Assigns forever,

the following described property:

A certain lot or parcel of land, with the buildings thereon, situated on the southwesterly side of Charles Street in said Portland, bounded and described as follows:

Beginning on said southwesterly side of Charles Street at a point thirty (30) feet northwesterly by said Street from the northeasterly corner of land formerly of Charles A. Donnell; thence northwesterly by said Street thirty (30) feet; thence southwesterly parallel with the line of said Donnell land seventy-four and two-tenths (74.2) feet to land formerly known as the Arsenal property; thence southeasterly by said Arsenal lot thirty (30) feet; thence northeasterly parallel with said Donnell land seventy-four and two-tenths (74.2) feet to the point of beginning.

Being the same premises conveyed to this Grantor and Clarence D. Read, as joint tenants, by Grace R. Loomis by deed dated September 1, 1948 and recorded in Cumberland County Registry of Deeds in Book 1926, Page 336. The said Clarence D. Read having deceased and his estate is of record in the Registry of Probate for Cumberland County, Maine.

The Grantor herein shall have the right to occupy the premises hereby conveyed until September 15, 1969.

3095/34/35

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said Maine Medical Center, its Successors

Heirs and Assigns, to them and their use and behoof forever.

And I do covenant with the said Grantee, its/ Successors Heirs and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will Warrant and Defend the same to the said Grantee, its Successors Heirs and Assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Clara G. Read, being a widow,

[redacted]

have hereunto set my hand and seal this 21st day of July in the year of our Lord one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered in presence of

John W. Sweeney

Clara G. Read

State of Maine,
CUMBERLAND } ss. July 23, 1969.

Personally appeared the above named

CLARA G. READ

and acknowledged the above instrument to be her free act and deed.

Before me,

John W. Sweeney
Justice of the Peace

JUL 23 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 10 H 58 M., and recorded in
BOOK 3095 PAGE 34 Leonard R. Thayer Register

(24)

Know all Men by these Presents,

161

That the CITY OF PORTLAND, a body politic and corporate, located in the County of Cumberland and State of Maine,

Portland City of to Maine General Hospital

Q C

in consideration of One ($1.00) Dollar and other valuable considerations, the total of which is less than One Hundred ($100.00) Dollars

paid by Maine General Hospital, a corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine,

the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said

Maine General Hospital, its successors and assigns forever,

A certain lot or parcel of land situated in said Portland and bounded and described as follows:

Beginning at the point of intersection of the Northwesterly side line of Ellsworth Street extended in a Southwesterly direction and the Southwesterly side line of Charles Street; thence Southwesterly along a continuation of the Northwesterly side line of Ellsworth Street extended, a distance of thirty-eight (38) feet, more or less, to a point; thence in a Southeasterly direction parallel to and fifty (50) feet measured perpendicularly Southwesterly of the Northeasterly side line of Charles Street Extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the Northerly terminus of Brackett Street as established and renamed by the City Council of the City of Portland; thence Northeasterly along the line terminating said Brackett Street a distance of thirty-eight (38) feet, more or less, to the point of intersection formed by the above-mentioned line and the Southwesterly side line of Charles Street Extension, so-called; thence Northerly along the Southwesterly side line of Charles Street Extension, so-called, a distance of one hundred fifty-five (155) feet, more or less, to the point of beginning.

Being the same premises conveyed to the Grantor by warranty deed of the Grantee dated April 9, 1954, recorded in Cumberland County Registry of Deeds in Book 2173, Page 412.

162

162

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said Maine General Hospital, its successors and Assigns forever.

And the said Grantor Corporation does covenant with the said Maine General Hospital, its successors and Assigns, that it will Warrant and Forever Defend the said premises to it the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

In Witness Whereof, the said CITY OF PORTLAND has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Edwin T. Simmons, Acting City Treasurer thereunto duly authorized, this Fifteenth day of August in the year one thousand nine hundred and fifty-six.

Signed, Sealed and Delivered in presence of

M. Jane King

CITY OF PORTLAND

By Edwin T. Simmons
Acting City Treasurer

(CORPORATE SEAL)

State of Maine. }
Cumberland } ss. August 15, 1956.

Personally appeared the above named Edwin T. Simmons, Acting City Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me

Justice of the Peace

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE AUG 21 1956
Received at 1 H — M and recorded in
BOOK 2808 PAGE 161

BK 13115PG241

027842

SHORT FORM QUITCLAIM DEED WITH COVENANT

NEW ENGLAND REHABILITATION HOSPITAL OF PORTLAND, INC., a Maine corporation with a place of business in Portland, Maine, FOR CONSIDERATION PAID, grants to MAINE MEDICAL CENTER, a Maine non-profit corporation with a place of business in Portland, Maine, with QUITCLAIM COVENANT, certain real property, together with any improvements thereon, located at Portland, Cumberland County and State of Maine, more particularly bounded and described on Exhibit A attached hereto and made a part hereof.

Being the same premises conveyed to the Grantor herein by deed from National Medical Care of Portland, Inc. dated September 4, 1986 and recorded in the Cumberland County Registry of Deeds in Book 7357, Page 18.

MAINE REAL ESTATE TAX PAID

IN WITNESS WHEREOF, New England Rehabilitation Hospital of Portland, Inc., has caused this instrument to be executed by ANTHONY J. TANNER, its VICE PRESIDENT & SECRETARY, thereunto duly authorized, this 15th day of May, 1997.

WITNESS:

New England Rehabilitation Hospital of Portland, Inc.

By: ANTHONY J. TANNER
Its VICE PRESIDENT AND SECRETARY

State of Alabama
Jefferson, ss.

May 15, 1997

PERSONALLY APPEARED the above-named Anthony J. Tanner, Vice President and Secretary of New England Rehabilitation Hospital of Portland, Inc. as aforesaid, and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity and the free act and deed of said corporation.

Before me,

Teresa A. Burchfield
Notary Public
Print Name: Teresa A. Burchfield
My commission expires January 29, 2001

SEAL

MAP 53 BLOCK G LOT 1

13115/241

EXHIBIT A

13 Charles Street

A certain lot or parcel of land lying within the block formed by Charles Street, Crescent Street, Wescott Street and Ellsworth Street in the City of Portland, County of Cumberland, and State of Maine being bounded and described as follows:

Beginning at a point on the Northerly side line of said Ellsworth Street said point being the most Southeeasterly corner of the parcel of land conveyed by James R. Gilchrist and Mary P. Gilchrist to Agnes M. Kierstead (now Agnes M. Maxfield) by deed dated July 20, 1956 and recorded in Cumberland County Registry of Deeds in Book 2302, Page 456, said point also being on a course N 60° 34' 35" E 27.51 feet from the intersection of the Easterly side line of said Charles Street and Northerly side line of said Ellsworth Street.

Thence by said Ellsworth Street N 60° 34' 35" E 104.72 feet to the Westerly side line of said Wescott Street;

Thence by said Wescott Street N 18° 20' 39.9" W 231.60 feet to the Southerly side line of said Crescent Street;

Thence by said Crescent Street S 80° 52' 32.0" W 131.77 feet to the Easterly side line of said Charles Street;

Thence by said Charles Street S 18° 24' 20.00" E 190.42 feet to land of said Kierstead;

Thence by land of said Kierstead N 71° 35' 40.0" E 27.00 feet to a point;

Thence by land of Kierstead S 18° 24' 20.0" E 82.44 feet to the point of beginning.

The above described parcel being 30,814 square feet in area.

The above described courses being magnetic and of the year 1951.

RECEIVED
RECORDED REGISTRY OF DEEDS
1997 JUN -3 PM 3:08
CUMBERLAND COUNTY
John B O'Brien

53-6-1

BK13115PG239

027841

SHORT FORM QUITCLAIM DEED WITH COVENANT

NEW ENGLAND REHABILITATION HOSPITAL OF PORTLAND, INC., a Maine corporation with a place of business in Portland, Maine, FOR CONSIDERATION PAID, grants to MAINE MEDICAL CENTER, a Maine non-profit corporation with a place of business in Portland, Maine, with QUITCLAIM COVENANT, certain real property, together with any improvements thereon, located at Portland, Cumberland County and State of Maine, more particularly bounded and described on Exhibit A attached hereto and made a part hereof.

Being the same premises conveyed to the Grantor herein by deed from Agnes Kierstead Maxfield dated August 31, 1988 and recorded in the Cumberland County Registry of Deeds in Book 8456, Page 199.

MAINE REAL ESTATE TAX PAID

IN WITNESS WHEREOF, New England Rehabilitation Hospital of Portland, Inc., has caused this instrument to be executed by ANTHONY J. TANNER, its VICE PRESIDENT & SECRETARY thereunto duly authorized, this 15th day of May, 1997.

WITNESS:

New England Rehabilitation Hospital of Portland, Inc.

By:

Its ANTHONY J. TANNER VICE PRESIDENT AND SECRETARY

State of Alabama
Jefferson, ss.

May 15, 1997

PERSONALLY APPEARED the above-named Anthony J. Tanner, Vice President and Secretary of New England Rehabilitation Hospital of Portland, Inc. as aforesaid, and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity and the free act and deed of said corporation.

Before me,

Notary Public
Print Name: Teresa A. Burchfield
My commission expires January 29, 2001

SEAL

MAP 53 BLOCK 6 LOT 13

EXHIBIT A

39 Ellsworth Street

A certain lot or parcel of land with the buildings thereon situated in said Portland in said County of Cumberland and State of Maine, on the Northeasterly corner of Ellsworth Street and a certain common passageway thirty (30) feet in width, running Northerly from Ellsworth Street, now called Charles Street, bounded and described as follows: Beginning at said Northeasterly corner of Ellsworth and Charles Street eighty-seven and seven-tenths (87.7) feet to a stake; thence Easterly at right angles from said Charles Street twenty-seven (27) feet to a stake; thence Southerly on a line parallel with the first described line eighty-two and four-tenths (82.4) feet to Ellsworth Street; thence Westerly by Ellsworth Street twenty-seven and one-half (27 1/2) feet to the point of beginning.

RECEIVED
RECORDED REGISTRY OF DEEDS
1997 JUN -3 PM 3:07
CUMBERLAND COUNTY
John B O'Brien

53-6-B

LOCUS 54/C-7

- [ ] LOCUS CHAIN
- [ ] ABUTTER
- [ ] ABUTTER CHAIN
- [ ] OTHER
- [ ] RESTRICTION

CLIENT Maine Medical Center
PROJECT
LOCATION Portland
PROJ. NO 01046

RESEARCHED BY ceg
DATE 7.12.02
SCALE 1"=25'

MAP 54 BLOCK C LOT 10

Vol./Page	Date	Name
		Maine Medical Center
2951/127	3/31/66	
	3/31/66	
		Helen Griffin

(1964)
EXECUTOR'S AND TRUSTEE'S DEED
(WHEN THE WILL AUTHORIZES A SALE)

927

Know all Men by these Presents,

That I, HELEN M. GRIFFIN

of Portland in the county of Cumberland

sole acting executor of the last will and testament

of Mary Davis late of Portland

deceased, testate, by virtue of the authority to me given by

the said Mary Davis in her last will and

testament, in my capacity of executor as afore-

said, and in consideration of One Dollar ($1.00) and other

valuable considerations

to me paid by MAINE MEDICAL CENTER, a corporation organized under the laws of Maine and situated in Portland

the receipt whereof is hereby acknowledged, do hereby sell and convey unto the said Maine Medical Center, its successors and assigns, the following described real estate, which was the property of the said Mary Davis.

A certain lot or parcel of land with the buildings thereon situated in Portland on the northerly side of Brackett Street, bounded and described as follows:

Beginning at the intersection of the northerly side of Brackett Street with the westerly side of Russell Street; thence running northeasterly by Russell Street thirty-seven (37) feet, more or less, to land formerly owned by Hobart W. Richardson; thence running northwesterly by said Richardson land seventy-four (74) feet, more or less, to land formerly owned or occupied by W. S. Dunn; thence southwesterly by the line of said Dunn's land forty-one (41) feet, more or less, to a lane; thence southeasterly by said lane forty-one (41) feet, more or less, to Brackett Street; thence easterly by Brackett Street thirty-seven (37) feet, more or less, to the point of beginning.

Being the same premises conveyed to Mary Davis by Harry E. Davis by deed dated March 18, 1915, recorded in Cumberland County Registry of Deeds in Book 945, Page 109.

Reference is made to Will of said Mary Davis, abstract of which is recorded in said Registry of Deeds in Book 3025, Page 28.

Davis Est

to

Maine Medical Center

Exec

54-C-10

2951/927

928

To have and to hold the above-granted premises unto the said Maine Medical Center, its successors ~~and~~ and assigns forever. And I the said Helen M. Griffin, in my said capacity, do hereby covenant to and with the said Maine Medical Center, its successors ~~and~~ and assigns, that I am the lawful executor of the last will and testament of the said Mary Davis ; that I have power under said will to sell as aforesaid; and that in making this conveyance, I have in all respects, acted in pursuance of the authority granted in and by the said last will and testament.

In Witness Whereof, I the said Helen M. Griffin in my said capacity of executor as aforesaid have hereunto set my hand and seal . this 31st day of March in the year of our Lord one thousand nine hundred and sixty-six.

Signed, Sealed and Delivered in presence of

Helen M Griffin

State of Maine, Cumberland ss. March 31 1966.

Then personally appeared the above named Helen M. Griffin and acknowledged the above instrument to be her free act and deed in her said capacity.

Before me,

Justice of the Peace.

MAR 31 1966
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 3 H 55 M P.M., and recorded in
BOOK 2957 PAGE 927 Harold B. Lynch Register

54-C-10

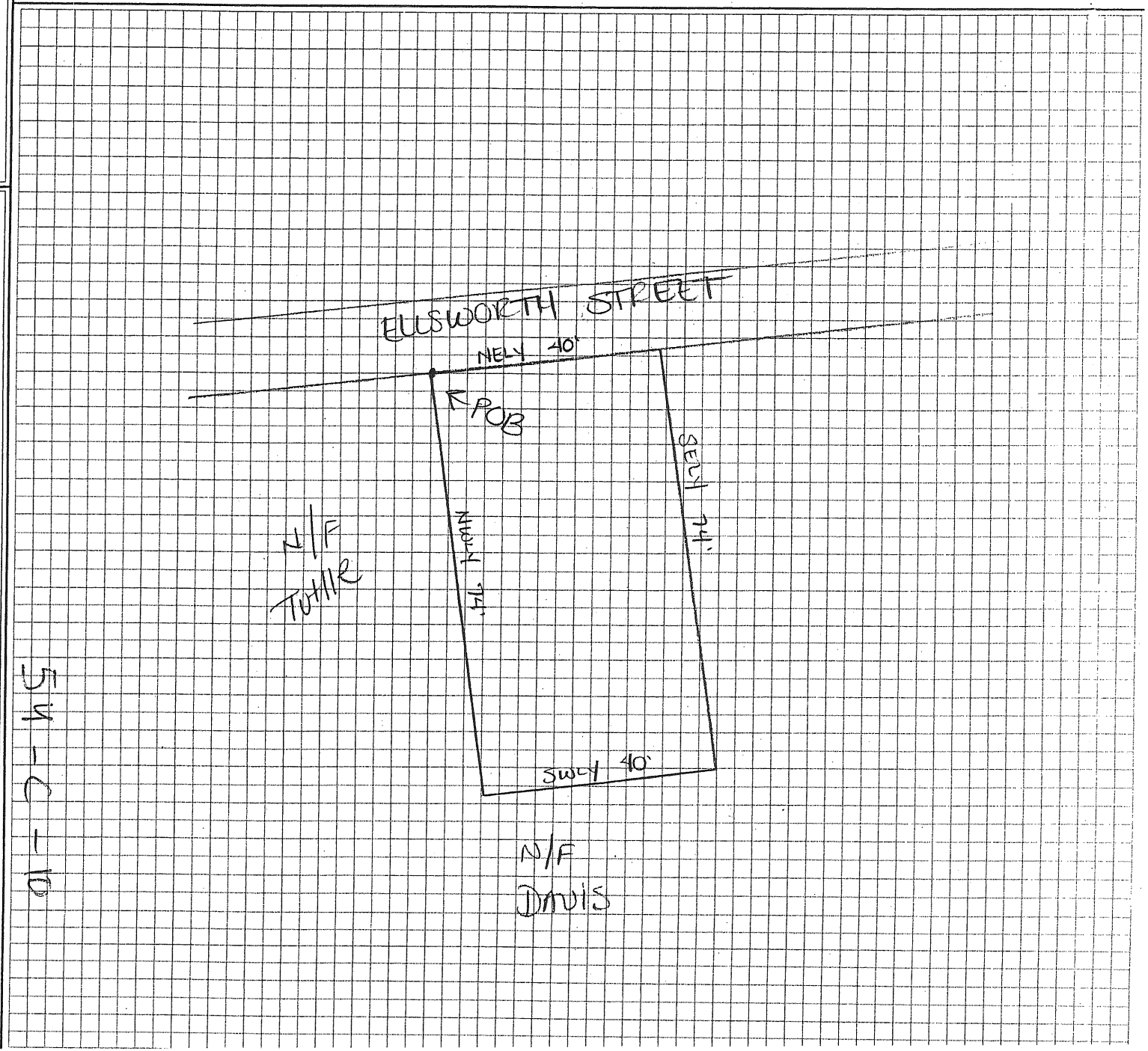
☐ LOCUS
☐ LOCUS CHAIN
☐ ABUTTER
☐ ABUTTER CHAIN
☐ OTHER

☐ RESTRICTION

CLIENT Maine Medical Center
PROJECT
LOCATION Portland
PROJ. NO 01046

RESEARCHED BY CLJ
DATE 7-12-02
SCALE 1"=25'

Vol./Page	Name	Date
	Maine Medical Center	
3097/244		8/11/69
		8/11/69
	William C. Gokey	



21.1

No. 100

Know All Men by these Presents,

That We, WILLIAM C. GOKEY and SUZANNE E. GOKEY, both of Portland in the County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable considerations

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of Maine and located at Portland, County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said Maine Medical Center,

its successors ~~Heirs~~ and Assigns forever,

the following described property:

A certain lot or parcel of land with the buildings thereon situated on the southeasterly side of Ellsworth Street in said Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at the northeasterly corner of a lot of land on Bramhall's Hill which John B. Brown sold to one Tuttle; thence northeasterly on said Ellsworth Street forty (40) feet; thence southeasterly about seventy-four (74) feet to land formerly of Davis; thence southwesterly by said Davis's land to land formerly of said Tuttle forty (40) feet; thence northwesterly to said Ellsworth Street, the bounds begun at, seventy-four (74) feet.

Being the same premises conveyed to William C. Gokey and Suzanne E. Gokey by Thelma A. Barter, by deed dated June 19, 1968, recorded in Cumberland County Registry of Deeds in Book 3045, Page 187.

This conveyance is made subject to taxes for the year 1969 which the Grantee assumes and agrees to pay.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
AUG 11 '69
Bureau of Taxation
18.15

54-C-10

3097/244

To have and to hold the aforegranted and bargained premises, 235
with all privileges and appurtenances thereof to the said
Maine Medical Center, its successors

and Assigns, to its and their use and behoof
forever.

And we do covenant with the said Grantee, its successors
and Assigns, that we are lawfully seized in fee of the premises;
that they are free of all incumbrances;
that we have good right to sell and convey the same to the said
Grantee to hold as aforesaid; and that we and our Heirs, shall
and will Warrant and Defend the same to the said Grantee,
its successors
and Assigns forever, against the lawful claims and demands
of all persons.

In Witness Whereof, we the said William C. Gokey
and Suzanne E. Gokey, being husband and wife

11th day of August in the year of our Lord
one thousand nine hundred and sixty-nine.

Signed, Sealed and Delivered
in presence of

Edward F. Dana

William C. Gokey

Suzanne E. Gokey

State of Maine,
Cumberland } ss. August 11, 1969

Personally appeared the above named
William C. Gokey
and acknowledged the above instrument to be his free act and
deed.

Before me,
Edward F. Dana
Justice of the Peace

AUG 11 1969
REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 2 H 24 M, and recorded in
BOOK 3097 PAGE 244 Edward F. Dana Register

54-C-10

☑ LOCUS
☐ LOCUS CHAIN
☐ ABUTTER
☐ ABUTTER CHAIN
☐ OTHER

☐ RESTRICTION

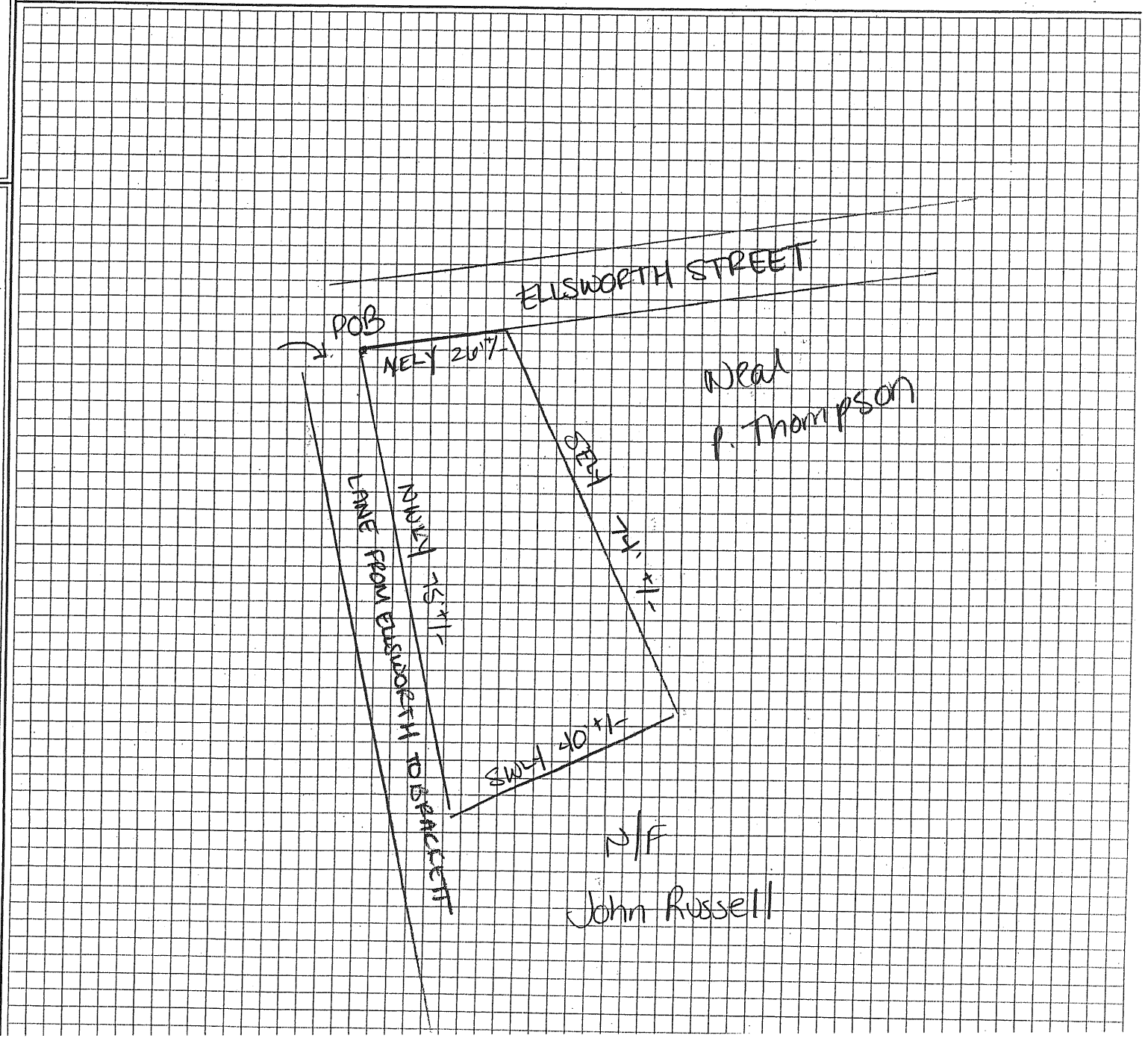
CLIENT IMC
PROJECT
LOCATION Portland
PROJ. NO 01046

RESEARCHED BY Ceg
DATE 7-12-02
SCALE 1"=25'

Vol./Page | Date
Name

Maine Medical Center
3187/234 | 8-23-71
8-23-71

Marguerite M. Brooks



234 18576

Know all Men by these Presents, That

I, MARGUERITE M. BROOKS of Portland, County of Cumberland and State of Maine

in consideration of one dollar and other valuable consideration
paid by MAINE MEDICAL CENTER, a corporation organized under the laws of the State of Maine with a place of business at Portland, County of Cumberland and State of Maine,
the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said
MAINE MEDICAL CENTER, its successors and assigns forever.

A certain lot or parcel of land with the buildings thereon, situated on the southeasterly side of Ellsworth Street, in the City of Portland, County of Cumberland and State of Maine, and at present numbered forty-four (44) on said street; said lot of land being bounded and described as follows:

Beginning at the northeasterly corner of Ellsworth Street and a lane running from said Ellsworth Street to the junction of Brackett and Arsenal Streets; thence northeasterly by said Ellsworth Street, twenty-six (26) feet, more or less, to land now or formerly of Neal P. Thompson; thence southeasterly by said Thompson land, seventy-four (74) feet, more or less, to land now or formerly owned by John Russell; thence southwesterly by said Russell land, forty (40) feet, more or less, to said lane; thence northwesterly by said lane, seventy-five (75) feet, more or less, to the point begun at.

Being the same premises conveyed to me by Walter E. Mangum et al by deed dated October 15, 1957 and recorded in Cumberland County Registry of Deeds in Book 2379, Page 181.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

STATE OF MAINE
REAL ESTATE TRANSFER TAX
A0623'71 Bureau of Taxation
PB-10852
$30.80

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said
MAINE MEDICAL CENTER, its successors
~~his~~ and assigns, to their use and behoof forever. And I do covenant with the said Grantee, its successors ~~his~~ heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances except as aforesaid, that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs and assigns shall and will warrant and defend the same to the said Grantee, its successors ~~his~~ and assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

In Witness Whereof, I, the said MARGUERITE M. BROOKS, being single,

~~joining in this deed as Grantor, and relinquishing and conveying all rights by descent and all other rights in the above described premises,~~ have hereunto set my hand and seal this 23rd day of August in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

Marguerite M. Brooks

State of Maine, Cumberland ss. August 23 1971.
Personally appeared the above named MARGUERITE M. BROOKS
and acknowledged the foregoing instrument to be her free act and deed.

Before me, ~~NOTARY PUBLIC~~ JUSTICE OF THE PEACE.

54-C-10

STATE OF MAINE, CUMBERLAND COUNTY, SS. REGISTRY OF DEEDS
Received AUG 23 1971 at 1 o'clock 40 m. P.M., and recorded
in BOOK 3187 PAGE 234 Attest: Register.

3187/234

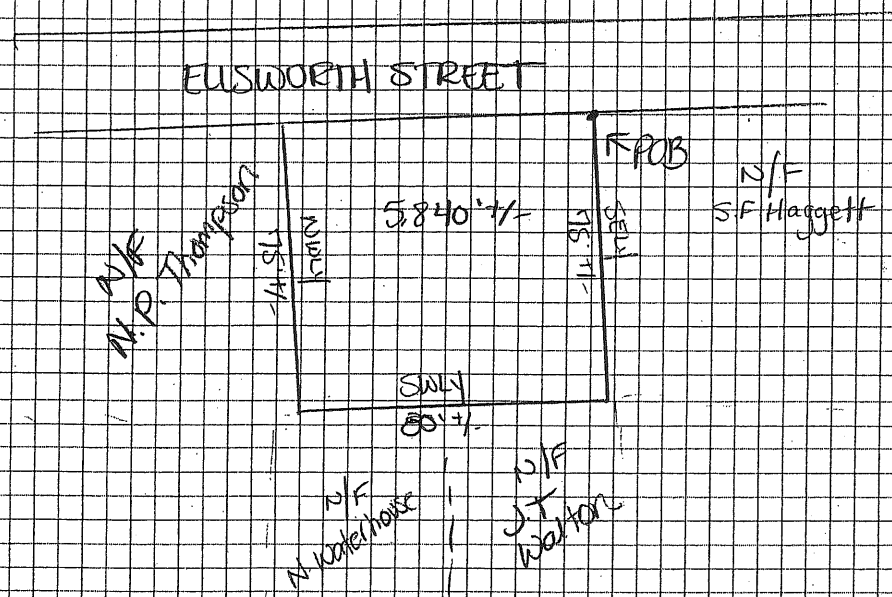
☐ LOCUS
☒ LOCUS CHAIN
☐ ABUTTER
☐ ABUTTER CHAIN
☐ OTHER

☐ RESTRICTION

CLIENT Maine Medical Center
PROJECT
LOCATION Portland
PROJ. NO 01040

RESEARCHED BY clg
DATE 4/20/07
SCALE 1" = 50'

MAP 54 BLOCK C Lot 6



Vol./Page Date
Name

Maine Medical Center
9722/45 9/20/91
9/20/91
↑
Estate of Edna Fale Kane
Thomas F Kane, JR - P.R.
1603/134 4-3-40
4-4-40
↑
May Porter
1081/325 8/4/21
8/5/21
↑
Lendall M. York
1008/157 4/26/18
5/6/18
↑
Katherine F. Griffin
1008/4 4/6/18
4/9/18
↑
Clara A. Currier
957/432 10/17/17
11/16/17
↑
George E. Currier

Katherine Griffin
1008/4 ↑
Clara A. Currier
957/432 ↑ 4/6/18
George E Currier
816/15 ↑ 12/6/10
Charles C. Young

Instr 47527 Bk 9722 Pg 45

47527

DEED OF SALE BY PERSONAL REPRESENTATIVE
(Testate)
Maine Statutory Short Form

Know all Men by these Presents,

That Thomas F. Kane, Jr.

of Scarborough, County of Cumberland, State of Maine,

duly appointed and acting personal representative of the estate of Edna Faye Kane,

deceased (testate), as shown by the probate records of the County of Cumberland, Maine,

(and having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale) ~~(and not having given notice to each person succeeding to an interest in the real property described below at least ten (10) days prior to the sale, such notice not being required under the terms of the decedent's will)~~, by the power conferred by the Probate Code, and every other power, for consideration paid, grants to Maine Medical Center* of Portland,

*a nonprofit corporation organized and existing under the laws of the State of Maine

County of Cumberland, State of Maine,

whose mailing address is 22 Bramhall Street, Portland, ME 04102,

the real property in Portland, County of Cumberland,

State of Maine, described as follows:

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the southeasterly side of Ellsworth Street, bounded and described as follows: -viz;-Beginning on the said southeasterly side of Ellsworth Street at land now or formerly of S.F. Haggett; thence southeasterly by said Haggett's land seventy-five (75) feet, more or less, to land now or formerly of J.T. Walton; thence southwesterly by said Walton's land and land now or formerly of N. Waterhouse eighty (80) feet, more or less, to land now or formerly of N.P. Thompson; thence northwesterly by said Thompson's land seventy-five (75) feet, more or less, to said Ellsworth Street; thence northeasterly by said Ellsworth Street to point begun at. Containing five thousand eight hundred forty (5,840) square feet, more or less. Said lot is numbered 34-36 and 38 as shown upon valuation plan of the City of Portland.

Being the same premises conveyed to Edna F. Kane by May Porter by her Warranty Deed, dated April 3, 1940 and recorded in Cumberland County Registry of Deeds in Book 1603, Page 134.

MAINE REAL ESTATE TAX PAID

54 - C - 6

9722/45

Instr 47527 Bk 9722 Ps 46

Witness my hand and seal this 20th day of September, 19 91.

Signed, Sealed and Delivered in presence of

Samuel J. Shatz

Personal Representative of the Estate of Edna Faye Kane

Thomas F. Kane, Jr.

Samuel J. Shatz

Thomas F. Kane, Jr.

State of Maine, County of Cumberland **ss.** September 20, 19 91.

Then personally appeared the above named Thomas F. Kane, Jr.

in his said capacity and acknowledged the foregoing instrument to be his free act and deed.

Before me,

54-C-6

Samuel J. Shatz

Samuel J. Shatz ~~Justice of the Peace~~ Notary Public Attorney at Law

Recorded
Cumberland County
Registry of Deeds
09/20/91 03:59:12PM
Robert P. Titcomb
Register

HUDSON & CLIFFORD, ATTORNEYS AT LAW
31 MALLET DRIVE, P.O. BOX 416, FREEPORT, MAINE 04032

576

No. 106

14804

Know All Men by these Presents,

That I, AGNES E. TWEEDIE, formerly AGNES E. BROWN, of Portland, County of Cumberland and State of Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MAINE MEDICAL CENTER, a corporation organized and existing under the laws of the State of Maine and having its principal place of business at Portland, County of Cumberland and State of Maine

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said MAINE MEDICAL CENTER,

its successors ~~Heirs~~ and Assigns forever,

the following described property: A certain lot or parcel of land, with the buildings thereon, situated in the City of Portland, County of Cumberland and State of Maine, on the corner of Brackett and Russell Streets and bounded as follows: Southwesterly by said Brackett Street; northwesterly by said Russell Street; northeasterly by land formerly of J. K. Emery and southeasterly by land now or formerly of Annie F. Chapman; containing about twenty-one hundred and fifty-one (2151) square feet.

Being the same premises conveyed to the Grantor herein and her late husband, Kenneth C. Brown, by deed dated January 22, 1962 and recorded in the Cumberland County Registry of Deeds, Book 2655, Page 344.

This conveyance is made subject to taxes for 1971 which the Grantee assumes and agrees to pay.

03136

STATE OF MAINE
REAL ESTATE TRANSFER TAX
AUG-2'71
Bureau of Taxation
$16.50

54-D-6

MAP 54 BLOCK D Lot 6

3183/576

To have and to hold the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said

MAINE MEDICAL CENTER, its successors

~~Heirs~~ and Assigns, to its and their use and behoof forever.

And I do covenant with the said Grantee, its successors ~~Heirs~~ and Assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my Heirs, shall and will Warrant and Defend the same to the said Grantee, its successors ~~Heirs~~ and Assigns forever, against the lawful claims and demands of all persons, except as aforesaid

In Witness Whereof, I the said

AGNES E. TWEEDIE, being a widow

and ~~wife of deceased~~

~~joining in this deed as grantor and releasing and conveying rights by descent and all other rights in the above described premises,~~ have hereunto set my hand and seal this day of in the year of our Lord one thousand nine hundred and seventy-one.

Signed, Sealed and Delivered in presence of

Agnes E. Tweedie

State of Maine,
Cumberland } ss.

July 30 1971

Personally appeared the above named AGNES E. TWEEDIE

and acknowledged the above instrument to be her free act and deed.

54-D-6

Before me,

~~Justice of the Peace~~ Notary Public

~~My commission expires~~

REGISTRY OF DEEDS, CUMBERLAND COUNTY, MAINE
Received at 2 H 11 M P.M., and recorded in
BOOK 3183 PAGE 376 AUG 2, 1971

Register

☐ LOCUS

☐ LOCUS CHAIN

☒ ABUTTER

☐ ABUTTER CHAIN

☐ OTHER

☐ RESTRICTION

CLIENT MMC

PROJECT

LOCATION Portland

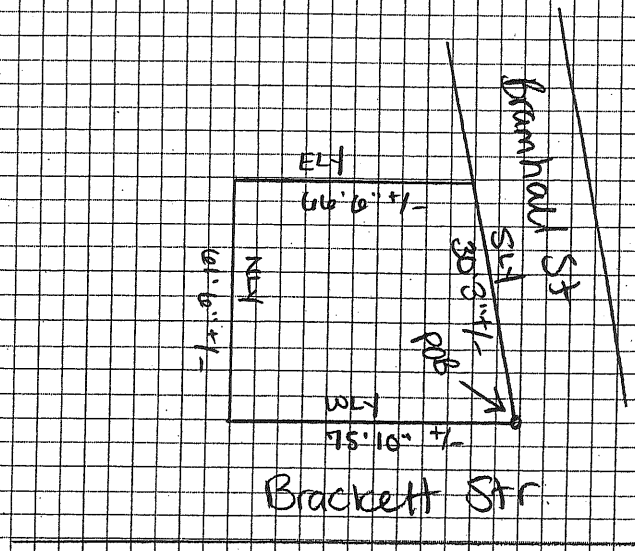
PROJ. NO 01046

RESEARCHED BY CEG

DATE 8/12/02

SCALE 1" = 50'

MAP 54 BLOCK D LOT 7



Vol./Page	Date	Name
		MMC Realty Grp.
8309/5	5/31/88 6/1/88	John + Elizabeth Hammett

024397 BK8303PG0005

QUITCLAIM DEED
With Covenant

Know all Men by these Presents,

That we, JOHN J. HAMMETT and ELIZABETH B. HAMMETT, both of Portland, County of Cumberland, Maine

in consideration of One Dollar ($1.00) and other valuable consideration

paid by MMC REALTY CORP., a Maine corporation with a place of business at 22 Bramhall Street, in the County of Cumberland, Maine

whose mailing address is 22 Bramhall Street, Portland, Maine 04102

the receipt whereof we do hereby acknowledge, do hereby remise, release, bargain, sell and convey, and forever quitclaim unto the said MMC Realty Corp., its

successors ~~heirs~~ and assigns forever,

A certain lot or parcel of land, with the buildings thereon, situated on the northwesterly corner of Bramhall and Brackett Streets, in said Portland, and bounded and described as follows:

Beginning at the northwesterly corner of Brackett and Bramhall Streets; thence westerly on Brackett Street seventy-five (75) feet ten (10) inches, more or less, to land conveyed by William H. Chapman to Charles E. Graham by deed of April 29, 1920 and recorded in the Cumberland County Registry of Deeds in Book 1050, Page 213; thence northerly by land now or formerly of said Graham sixty-one (61) feet six (6) inches, more or less, to land conveyed by Alden J. Blethen to James K. Emery by deed dated April 30, 1880 and recorded in said Registry of Deeds in Book 467, Page 152; thence easterly by land now or formerly of said Emery sixty-six (66) feet six (6) inches to Bramhall Street; thence southerly by said Bramhall Street thirty (30) feet three (3) inches, more or less, to the point of beginning.

Being the same premises conveyed to the Grantors herein by Sumner J. Goffin by deed dated February 4, 1950 and recorded in said Registry of Deeds in Book 1985, Page 483.

54-D-7

MAINE REAL ESTATE TRANSFER TAX PAID

8399 15

BK8309PG0006

To have and to hold the same, together with all the privileges and appurtenances thereunto belonging, to the said MMC Realty Corp., its successors

~~heirs~~ and assigns forever.

And we do ~~covenant~~ with the said Grantee, its/ successors ~~heirs~~ and assigns, that we shall and will ~~warrant and defend~~ the premises to the said Grantee, its/ successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under us.

In Witness Whereof, we, the said John J. Hammett and Elizabeth B. Hammett

~~husband/wife of the said~~

~~claiming an inchoate right of dower in said premises, releasing and conveying all rights by descent and all other rights in the above described premises,~~ have hereunto set our hands and seals this 31st day of the month of May, A.D. 19 88.

Signed, Sealed and Delivered
in presence of

Lee D. Urban

Lee D. Urban

John J. Hammett
John J. Hammett

Elizabeth B. Hammett, By John J. Hammett as her Attorney in Fact pursuant to Power of Attorney dated August 16, 1984 and recorded herewith in the Cumberland County Registry of Deeds

State of Maine, County of Cumberland **ss.** May 31, 1988.

Then personally appeared the above named John J. Hammett

and acknowledged the foregoing instrument to be his free act and deed.

54-D-7

Before me,

Lee D. Urban

~~Notary Public~~
Attorney at Law

Printed Name Lee D. Urban

RECORDED - CUMBERLAND COUNTY DEEDS
1988 JUN -1 AM 8:31
CUMBERLAND COUNTY
James E. Walsh

Doc #: 70847 Bk: 18032 Ps: 68

TRUSTEE'S DEED

GORDON D. SIMONDS, TRUSTEE OF THE R.G. SIMONDS TRUST, under Declaration of Trust dated November 28, 1996, by the power conferred by law, and every other power, in consideration of One Dollar and other valuable consideration, grants to MAINE MEDICAL CENTER, a Maine nonprofit corporation of Portland, County of Cumberland and State of Maine, whose mailing address is 22 Bramhall Street, Portland, Maine 04102, the real estate in the City of Portland, County of Cumberland and State of Maine, as more particularly described on Exhibit A attached hereto and made a part hereof.

Witness my hand and seal this 4th day of September, 2002.

MAINE REAL ESTATE TAX PAID

Estelle A Lavoie
Witness

Gordon D. Simonds, TRUSTEE
Gordon D. Simonds, as Trustee of
the R.G. Simonds Trust and
not individually

STATE OF MAINE
County of Cumberland

September 4, 2002

Then personally appeared the above-named Gordon D. Simonds in his capacity as Trustee of the R.G. Simonds Trust and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Estelle A Lavoie
~~Notary Public~~/Attorney at Law

ESTELLE A. LAVOIE
Type or Print Name

MAP 53 Block E Lots 1, 2, 10-13

EXHIBIT A
TO TRUSTEE'S DEED

15 CRESCENT STREET

A certain lot or parcel of land with the buildings thereon situated on the northerly side of Crescent Street ("Cresent" in original) in the City of Portland, County of Cumberland and State of Maine, and being described as follows:

Beginning on the northerly side of Crescent Street, formerly "O" Street, at the westerly corner of land conveyed by Edward E. Proctor to J.L. Spear by deed dated May 4, 1888 and recorded in the Cumberland County Registry of Deeds in Book 547, Page 6; thence by said northerly side of Crescent Street, westerly sixty one and sixteen hundredths (61.16) feet to a point; thence northerly along the westerly boundary line of the lot of land conveyed to Edwin G. Foster by Charles P. Garland by warranty deed dated July 18, 1889 and recorded in said Registry of Deeds in Book 561, Page 224, sixty five (65) feet, more or less, to the northwesterly corner of said lot conveyed to said Foster by said Garland; thence easterly seventy and four tenths (70.4) feet along the northerly boundary line of said lot conveyed to said Foster by said Garland and along the southerly boundary line of the lot of land conveyed by said Foster to Charles P. Garland by warranty deed dated July 18, 1889 and recorded in said Registry of Deeds in Book 561, Page 185, to the southeasterly corner of said lot conveyed by said Foster to said Garland; thence southerly sixty five and forty eight hundredths (65.48) feet, more or less, along the westerly boundary line of said lot conveyed by Edward E. Proctor to J.L. Spear to the point of beginning.

Being the same premises conveyed to Gordon D. Simonds, as Trustee of R.G. Simonds Trust by deed of Joseph M. Ronzo et al. dated June 26, 2000 and recorded in the Cumberland County Registry of Deeds in Book 15563, Page 336.

25 CRESCENT STREET

A certain lot or parcel of land, together with the buildings and improvements thereon, situated on the northerly side of Crescent Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning in the angle of Crescent Street marked by a three foot off-set City Monument, and at the westerly corner of land now or formerly of E. B. Cummings; thence westerly by the northerly line of Crescent Street, a distance of forty-two and 7/10 (42.7) feet to a point and center line of a fence; thence by an included angle to the left, northerly of 89° 58' by said fence line, a distance of one hundred seven (107) feet, more or less, to the southerly line of Congress Street; thence easterly by said line of Congress Street, a distance of fifty-four and 5/10 (54.5) feet, more or less, to the angle of Congress Street and land formerly of Josephine L. Dalton, now or formerly of Thomas C. Freeman; thence southerly by a direct line drawn between this last named angle and the angle of Crescent Street, aforesaid, a distance of one hundred nine (109) feet, more or less, to the angle and point of beginning; said premises being numbered 25 Crescent Street.

53 - E - 1, 2, 10, 13

Excepting and reserving, however, from this parcel, a portion thereof fronting on Congress Street, more particularly bounded and described in the warranty deed given by Charles J. Peters, et al, to James B. Peters, et al, recorded in the Cumberland County Registry of Deeds in Book 2454, Page 25.

Being the same premises conveyed to Gordon D. Simonds, as Trustee of the R.G. Simonds Trust, by deed of Eugene C. D'Alessandro, Sr. and Eugene C. D'Alessandro, Jr. as Trustees of The Crescent Street Trust dated August 5, 1999 and recorded in the Cumberland County Registry of Deeds in Book 14959, Page 63.

(3)

33 CRESCENT STREET

A certain lot or parcel of land, with the buildings and improvements situated on or about 33 Crescent Street in the City of Portland, County of Cumberland and State of Maine, further described as follows:

A certain lot or parcel of land situated on the northerly side of Crescent Street in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

BEGINNING at a point on the northerly sideline of Crescent Street, said point being distant 111.6 feet westerly from the angle in the sideline of said Crescent Street; thence westerly 43 feet by said sideline of Crescent Street to a point and from these two points to run northerly at right angles to said Crescent Street holding the width of 43 feet to Congress Street.

Being the same premises conveyed to Gordon D. Simonds, Trustee of the R.G. Simonds Trust by deed of Rebecca Chagrasulis dated June 28, 2000 and recorded in the Cumberland County Registry of Deeds in Book 15569, Page 208.

(4)

35-37 CRESCENT STREET

A certain lot or parcel of land, together with the buildings thereon, situated in the City of Portland, County of Cumberland and State of Maine, on the Northerly side of Crescent Street, bounded and described as follows:

BEGINNING at a point on the Northerly side of Crescent Street at the most Easterly corner of land conveyed by Edward E. Proctor to Henry M. Jones by deed dated November 24, 1890 and reocrded in the Cumberland County Registry of Deeds in Book 577, Page 325; thence running northwardly by said Jones land to the Southerly side line of Congress Street; thence Northeasterly by said Congress Street, forty-three (43) feet to a point; thence Southeasterly on a line parallel with said Jones land and holding a width of forty-three (43) feet to the Northerly side of Crescent Street; thence Southwesterly by Crescent Street, forty-three (43) feet to the point of beginning.

Also a certain strip of land ten (10) feet wide adjoining the above-described premises on the Southwest side and being the same which were conveyed to Lucinda P. Proctor by Henry A.

53 - E - 1, 2, 10, 13

Sargeant by deed dated August 4, 1896 and recorded in the Cumberland County Registry of Deeds in Book 639, Page 284.

Being a portion of the premises conveyed to Gordon D. Simonds, Trustee of the R.G. Simonds Trust by deed of Ruth G. Simonds dated October 26, 2001 and recorded in the Cumberland County Registry of Deeds in Book 17505, Page 181.

EAL.Simonds.2002.TrusteesDeed

Received
Recorded Register of Deeds
Sep 04,2002 11:48A
Cumberland County
Jack D Brien

53 - E - 1, 2, 10, 13

Section 3

Financial Capacity

Financial Capacity

The total estimated cost of construction is approximately $77.7 million. The development will involve the construction of a four-story medical building, parking garage, helipad, central utility plant, roadway realignment, all associated utility installation, and landscaping.

The applicant is proposing to finance the proposed development through a combination of debt, existing reserves, and community fund raising. We have enclosed our Standard and Poor's rating demonstrating our ability to finance the project.

STANDARD &POOR'S PUBLIC FINANCE

Publication date: 26-Aug-2003
Reprinted from RatingsDirect

MaineHealth; Health Care, System

Credit Analysts: Kenneth W Rodgers, New York (1) (212) 438-2087; Marc Severia, Boston (1) 617-371-0315

Rationale

Standard & Poor's Ratings Services assigned its 'AA-' Issuer Credit Rating (ICR) to MaineHealth (MH), the regional acute care health system based in Portland, Maine whose flagship hospital is the 580-staffed bed Maine Medical Center (MMC).

An ICR is a current opinion of an obligor's overall capacity and willingness to meet its financial obligations that is not specific to any particular debt instrument.

The 'AA-' ICR assigned to MH reflects this health system's excellent governance and management, a very strong regional economy (Maine 'AA+' GO; Cumberland County 'AA' GO and Portland 'AA' GO), strong patient utilization and market share trends, a highly skilled medical staff and very strong financial operating performance with modest debt.

MaineHealth posted positive excess margins averaging 3.8% annually over the past four years and pro forma debt service coverage is strong at 2.7x. Historically, debt to capitalization, a measure of leverage, has been very strong at less than 30%.

Credit weaknesses include moderate competition, an adequate liquidity position in the face of expected rising capital needs and certain statewide constraints on hospitals financial flexibility imposed by the recent passage of the Dirigo Health Plan (DHP).

DHP is a recently passed legislative initiative to provide more affordable health insurance coverage to small employers and others that may not have had access to adequate health insurance. DHP requests hospitals to voluntarily limit the increase in their cost per adjusted discharge to 3.5% and their operating margins to 3% during the coming year. In addition, a one-year moratorium has been placed on certificate of need approvals for major hospital building projects. While it remains to be seen what impact DHP will have on MH and other hospitals throughout the state, the possibility exists that DHP could lessen hospitals' profitability thereby constraining hospitals' cash flow and ability to replace needed aged capital facilities.

Outlook

The stable outlook assumes MH will continue to be the leading provider of health services to the state's residents in the near term. It is also assumed that despite the constraints imposed by the recently enacted Dirigo Health Program, MH will continue to be profitable and will have modest liquidity relative to its growing need for capital.

Organizational Overview

MaineHealth comprises five hospitals licensed for a total of 819-beds that currently staff 777-beds. In addition, MaineHealth has certain strategic affiliations and joint ventures with four other hospitals located throughout its service area despite also competing with these hospitals for certain services.

Post-it® Fax Note 7671 | Date | # of pages ▶
To Will Conway | From Hank Dunn
Co./Dept. Sebago Technics | Co. MMC
Phone # | Phone #
Fax # 856-2200 | Fax #

MaineHealth also owns and operates other health related businesses including a successful regional reference lab, home health businesses and senior living facilities.

MaineHealth and other system members serve residents of a ten county service area with a population in excess of 900,000 that is anticipated to approach a population of one million within the next decade. MH recorded 37,879 patient discharges in the fiscal year ending September 30, 2002, a 7.2% increase over the past five years, and produced total revenue of $649 million. Half of the total acute care rendered in the state is provided at facilities associated with MH and its strategic affiliates (these affiliates are not-owned or controlled by MH).

MaineHealth's flagship hospital is MMC-the largest hospital north of Boston and a major teaching affiliate of the University of Vermont College of Medicine. MMC's 1,086 medical staff members include 812 attending and consulting physicians with an impressive overall board certification rate of 94.2%. MMC is a comprehensive health services provider offering acute, secondary and tertiary services including: trauma care, the state's only level III neonatal intensive care unit and a licensed children's hospital among other services. The only services not offered at the present time are liver and heart transplant services, a burn unit and limb re-attachments.

Market Share & Competition

MaineHealth has a total market share of patient discharges originating from its ten county service area of approximately 32%. Together with its strategic affiliates, MaineHealth's total market share is slightly in excess of 60%. MaineHealth's strategic affiliates are: MaineGeneral Medical Center – a 300-bed hospital with campuses in Augusta and Waterville, MidCoast Hospital-an 80-bed facility in Brunswick, Southern Maine Medical Center-a 150-bed facility located in Biddeford and St. Mary's Regional Medical Center-a 150-bed facility located in Lewiston. These strategic affiliates are also competitors of MH along with Central Maine Medical Center in Lewiston, Eastern Maine Medical Center in Bangor ('A+' ICR) and the 200-bed Mercy Hospital in Portland.

Finances

MaineHealth's financial performance is very strong posting excess or bottom line margins in the range of 2% to 4% over the past three years. In the six-month period ending March 31, 2003, MH recorded a 1.4% operating margin and a 2.9% excess margin. Historical debt service coverage exceeds 3.0x for each of the past five years. Historical pro forma debt service coverage based on future maximum annual debt service, including $68 million of debt to be issued later this year by MMC, averages 2.7x for the past three fiscal years.

MH has been very conservative in its asset management and debt issuance practices. MH's unrestricted cash and investments total $241 million at March 31, 2003 equating to a modest 143 days cash on hand figure (Standard & Poor's 2002 median days cash on hand ratio for hospitals rated 'AA-' is 173 days). Monies in the operating fund at MMC totaled $221 million at June 30, and were invested 77% in fixed income instruments, 18% in cash and cash equivalents and only 5% in equities. As a result of conservative investment practices, MH has had only minimal non-temporary investment losses on its portfolio unlike a lot of other major health systems.

Debt to capitalization or leverage has historically been below 30% and rises to only 35% with the debt to be issued later this year by MMC.

In part, the health system's modest liquidity position reflects capital spending which has averaged $57 million annually over the past five years compared to

average annual cash flow from depreciation alone, for the same period, totaling $29 million. Over the six-year period beginning in fiscal 2004 and ending in fiscal 2009, MH anticipates capital expenditures totaling $399 million or an annual average of $66.5 million. Future debt issuance of $68 million by MMC is likely later this year to provide some of the funding for the future capital expenditures. A fundraising campaign also will be launched shortly to defray some of the costs of the capital plan.

Financial Statistics – Maine Health And Subsidiaries					
		Fiscal Year Ended			
	Six Months Ending March 31, 2003	Sept. 30, 2002	Sept. 30, 2001	Sept. 30, 2000	Sept. 30, 1999
Income Statement & Cash Flow					
Operating revenue ($000s)	332,510	640,813	573,550	506,489	457,159
Total expenses ($000s)	327,769	636,717	571,138	516,906	453,090
Operating income ($000s)	4,741	4,096	2,412	(10,417)	4,069
Operating margin (%)	1.43	0.64	0.42	(2.1)	0.87
Net non-operating revenues ($000s)	5,260	8,431	16,640	31,074	26,615
Excess income ($000s)	10,000	12,527	19,052	20,657	30,684
Excess margin (%)	2.84	1.93	3.23	3.85	6.21
Earnings before int, dep & amt to total rev (%)	10.0	9.0	10.3	11.1	12.7
Cash flow to total liabilities (%)	18.30	14.98	17.54	18.12	19.41
Capital expenditures ($000s)	N.A.	54,513	59,740	54,169	64,752
Debt					
Net available for debt service ($000s)	33,483	58,658	60,750	59,419	62,776
Pro forma maximum debt service ($000s)	11,014	22,027	22,027	22,027	22,027
Pro forma maximum debt service coverage (x)	3.04	2.66	2.76	2.70	2.85
Maximum debt service to total revenue (%)	3.23	3.39	3.73	4.10	4.46
Balance Sheet					
Unrestricted cash & investments ($000s)	241,057	215,236	211,628	195,776	206,785
Days' cash on hand	143	131	144	147	172
Cash to debt (%) *	101	128	141	124	137
Cushion ratio (x)	10.94	9.77	9.61	8.43	9.39
Net fixed assets ($000s)	330,815	320,343	303,146	276,687	254,196
Long-term debt ($000s) *	236,682	168,582	150,145	149,683	150,527
Unrestricted fund balance ($000s)	434,524	418,673	403,850	382,315	359,649

Debt to capitalization (%) *	35.29	28.72	27.10	28.14	29.50
Average age of plant (years)	N.A.	6.57	6.42	6.11	6.73
N.A.-Not Available; * Pro forma for interim period only inclusive of $68 million of debt forthcoming later this year.					

This report was reproduced from Standard & Poor's RatingsDirect, the premier source of real-time, Web-based credit ratings and research from an organization that has been a leader in objective credit analysis for more than 140 years. To preview this dynamic on-line product, visit our RatingsDirect Web site at www.standardandpoors.com/ratingsdirect.
Standard & Poor's
Setting the Standard

The McGraw-Hill Companies

Section 4

Technical Ability

01046

Section 4

Maine Medical Center
Technical Ability

The applicant for the development of the Maine Medical Center Bramhall Campus is Maine Medical Center. Maine Medical Center has developed a number of similar hospital improvements throughout the years at the Bramhall, Brighton, Scarborough and Falmouth Campuses. Accordingly, Maine Medical Center has the technical ability to develop the proposed project.

Additionally, Maine Medical Center has contracted W. A. Berry & Son, Inc. to act as the construction manager for the project. The project design team includes Sebago Technics, Inc. providing site and landscaping design services, The Ritchie Organization for the architectural design services, Simpson Gumpertz Heger, Inc. for structural design services, Gorill Palmer Consulting Engineers, Inc. for traffic analysis services, and S. W. Cole for Geotechnical Engineering Services. The firms involved in the design have worked on designing and constructing many similar projects.

Sebago Technics, Inc.
Technical Ability

Sebago Technics has been retained to perform the civil engineering, stormwater management, and sediment and erosion control design for the proposed project. In addition, we have prepared the necessary paperwork for the City of Portland permitting processes. The technical phase of this project includes the preparation of a detailed utility and grading design, taking into account existing utilities and stormwater management. The permitting phase of this project consists of the preparation of all state and local application packages and coordination throughout the entire review process from initial submission to final approval.

Company Background

The firm was established in 1981. The company as a whole has grown to approximately 65 professionals. The firm consists of civil/site engineers, surveyors, landscape architects, soil scientist, and other professionals. In 1986, a computer-aided design drafting (CADD) division was established to further enhance our scope of available services. Sebago Technics, Inc. provides full-range technical assistance to developers, contractors and municipalities in the areas of commercial, residential and industrial developments.

Key Personnel

Walter P. Stinson, P.E.

President and founder of Sebago Technics, he is a Registered Professional Engineer with a background that includes experience with the Department of Agriculture, Soil Conservation Service. He has a strong interest in land management, experience in grading and drainage practices, and maintains a strong involvement in all significant projects of the firm.

Charles L. Brown, P.L.S.

A Registered Land Surveyor, he joined the firm in 1984. His expertise in boundary and topographic surveying provides comprehensive land planning and design services to clients.

William Conway, R.L.A., Vice President, Landscape Architecture

Mr. Conway has eighteen years experience with multi-disciplinary professional teams, and sound project management experience with municipal agencies, corporate clients, and private developers. He has established a discipline of master planning, land planning, and landscape architecture at Sebago Technics, providing the firm with a strong design influence.

Daniel L. Riley, P.E., Senior Project Manager

A registered Professional Engineer, he joined the firm in 2001 as a Senior Project Manager. His 11 years of practice in consulting engineering firms provides the required experience to allow for effective project management and engineering design.

Section 5

Noise

Section 5

Noise

A. Developments Producing a Minor Noise Impact

1. *Residential Developments*

N/A

2. *Certain Non-Residential Subdivisions*

N/A

3. *Schools or Hospitals*

The development of this project is for a hospital, which is a development producing a minor noise impact; however, the applicant has developed a noise study for the Central Utility Plant (see enclosed).

4. *Other Developments*

N/A

B. Developments Potentially Producing a Major Noise Impact

N/A

CAVANAUGH
TOCCI
ASSOCIATES, INCORPORATED

327 F BOSTON POST ROAD, SUDBURY, MA 01776-3027 TEL: (978) 443-7871 FAX: (978) 443-7873 e-MAIL: cta@cavtocci.com

SENIOR PRINCIPALS
WILLIAM J. CAVANAUGH, *FASA, Emeritus*
GREGORY C. TOCCI, *PE, FASA, PRESIDENT*

PRINCIPALS
DOUGLAS H. BELL, *INCE*
LINCOLN B. BERRY, *ASA*
TIMOTHY J. FOULKES, *INCE, Bd. Cert.*
K. ANTHONY HOOVER, *INCE, Bd. Cert.*
MATTHEW J. MOORE

SENIOR AND STAFF CONSULTANTS
ANDREW C. CARBALLEIRA
JOHN T. FOULKES
BRION G. KONING
BRIAN L. MASIELLO
ERIC L. REUTER
ROSE MARY SU

MARKETING MANAGER
PATRICIA A. CASASANTO

ASSOCIATED CONSULTANTS
NICHOLAS BROWSE, *SMPTE*
RICHARD G. CANN, *PE*
DAVID H. KAYE, *FASA, FAES*
STEWART RANDALL, *CTS*

ADMINISTRATOR
DONNA L. RAFUS

January 5, 2003

Mr. Thomas Lam
The Ritchie Organization
80 Bridge Street
Newton, MA 02158-1134

Fax: *617.332.4669*

SUBJECT: Maine Medical Center – Central Utility Plant
Portland, Maine
Environmental Noise Study of Building Mechanical Equipment

Dear Tom,

This letter presents our environmental noise evaluation and control recommendations for the mechanical equipment in the proposed Central Utility Plant of Maine Medical Center. Based on the mechanical equipment information provided by your firm, we have developed a model which estimates sound levels produced by plant equipment and transmitted to nearby properties. The study locations are shown in SK-1 attached with this letter. The predicted sound levels are compared to the applicable noise criteria for the City of Portland, Maine. The estimated sound levels provided in this letter report include noise controls needed to ensure that plant sound levels do not exceed the Portland noise criteria as discussed below.

Criteria

There are two regulations known to be applicable to the City of Portland, ME. The first is the Maine Department of Environmental Protection Site Development Law and the second is the City of Portland Noise Ordinance.

The Maine DEP Site Development Law Chapter 375 Section 10-B (1) states that: *"This regulation [Control of Noise] applies to proposed developments within municipalities without a local quantifiable noise standard and in unorganized areas of the State…"* Since the City of Portland contains a quantifiable noise standard, the Maine DEP Site Development Law permits its preemption by the City ordinance as long as the City limits are not higher than 5 dBA above the MDEP limits.

The City of Portland Noise Ordinance states various sound limits depending on the zoning classification. The most conservative criteria, applicable to B2, B2b, B3, B3b zones, states that daytime sound levels (7 AM to 9 PM) should not exceed 60 dBA, and nighttime sound levels (9 PM to 7 AM) should not exceed 55 dBA. These criteria are within 5 dBA of the Maine DEP limits, therefore they are permitted by the MDEP Site Development Law.

However, the Portland Noise Ordinance does not set limits for all zones, including the R6 zone surrounding the power plant. Out of regard for the adjacent neighborhood, we have adopted the above-mentioned 60 dBA day / 55 dBA night noise limits for this study of Maine Medical Center Central Utility Plant noise. This is a reasonable and conservative course of action since the ambient sound in this area ranges between 57 and 63 dBA during the day, and between 54 and 62 dBA at night. (Sound data are taken from previous sound study report for MMC by Resource Systems Engineering). These levels are above the limits implying that the MMC addition will not be significant.

Facility Noise Analysis and Noise Control

We have estimated sound levels produced by outdoor mechanical equipment using computer spreadsheet modeling. The following is a list of equipment included in our study.

- Emergency Generators 2000 kW (2 units)
- Cooling Towers – 80% Fan Speed (6 cells)
- Chiller Room and Boiler Room Air Handling Units –(2 units)
- Chillers - 1200 Tons (3 units)
- Boilers - 1100 HP (3 units)
- Emergency Room Exhaust Fans – 1170 rpm (2 units)
- Other Mechanical Room Exhaust Fans – various (5 units)

Nearest residential neighbors are across Gilman Street, approximately 70 feet away from the façade of the plant.

Table 1 shows estimated sound levels at the selected study locations shown in SK-1 presuming implementation of recommended noise control equipment and methods. Table 2 in the appendix section also shows contributions of individual equipment items to total estimated sound levels at receptor locations.

The sound attenuators indicated in the mechanical equipment schedule have been used in developing our environmental noise model. In our modeling, we have used sound attenuators by Industrial Acoustics Company. Attenuators with similar dynamic insertion loss (DIL) values may be used. Note that certain sound attenuators shown in the drawings are not shown in the mechanical schedule.

Study Location	Total w/o Emergency Generators	Total with one Emergency Generator	Total with two Emergency Generators	Portland Nighttime Limit	Portland Daytime Limit
1	42	47	55	55	60
2	51	54	55	55	60
3	51	52	53	55	60

Table 1. Summary of predicted sound levels by the Central Utility Plant mechanical equipment to Study Locations shown in SK-1

Maximum plant sound levels occur when emergency generators are in operation for maintenance purposes. We expect that this will occur for approximately ½ hour per week during either daytime or nighttime hours. For most of the time, sound levels during the day and night will be approximately what is shown in the second column of Table 1.

We have provided additional noise control recommendations to ensure that sound levels will be within the nighttime limit set by the City of Portland. We assumed all other equipment to be in full operation day and night for our environmental noise model

Below are noise control measures needed to achieve the result shown in Table 1:

Emergency Generators

Emergency Generator Room Treatment
Mount sound absorbing panels on 50% of the emergency generator room walls. These can be Tectum with fiberglass backing as shown in SK-2.

Emergency Generator Room Intake
Install an 84" long sound attenuator model LFS by Industrial Acoustics Company (IAC).

Emergency Generator Discharge
Install the 60" long sound attenuator now shown in the drawings for the emergency room discharge. (IAC model LFS or equal)

Emergency Generator Exhaust
The critical grade exhaust muffler is adequate for noise control. Super critical grade muffler is not necessary.

Emergency Generator Room Roof Exhaust Fans
Install 36" long cylindrical sound attenuators on the discharges. These may be IAC model FCL or equal.

Install 36" long rectangular sound attenuators on the bypass air intake openings of the exhaust fans located at the roof level. Use of an acoustical louver is permitted.

Emergency Generator Room Exhaust
Install the 60" long sound attenuator now shown in the drawings on the propeller exhaust fans serving the emergency generator rooms. This may not be feasible and may require a different type of fan to enable installation of the recommended silencer. (IAC model LFS or equal)

Boiler Room

Boiler Room Intake
Install the 60" long sound attenuator now shown in the drawings on the boiler room air intake. (IAC model LFS or equal)

Boiler Room Relief Louver
Install the 60" long sound attenuator now shown in the drawings on the boiler room relief air opening. (IAC model LFS or equal)

Chiller Room

Chiller Room Intake
Install the 60" long sound attenuator now shown in the drawings on the chiller room air intake. (IAC model LFS or equal)

Chiller Room Exhaust
Install 36" long sound attenuator on the chiller room exhaust opening. (IAC model LFS or equal)

Cooling Towers

Our modeling has included the full operation of the four cooling tower cells now proposed plus operation of two future cells. Resulting sound levels are acceptable at 80% fan speed.

Metal Panel for the Front Façade of the Central Utility Plant

Upgrade the metal panels from 26 gauge to 22 gauge, this will reduce sound transmission from the utility plant equipment to the neighbors across the street.

All noise control recommendations are based on the preliminary design of the Central Utilities Plant. Should there be any changes to the equipment or design, we will provide more specific noise control recommendations where necessary to meet the day and nighttime noise limits.

Conclusions

With the above noise control recommendations implemented, sound levels associated with the proposed Maine Medical Center power plant will be conform to the City of Portland noise criteria.

If you have any questions, please contact us. Thank you.

Sincerely,
CAVANAUGH TOCCI ASSOCIATES, INC.

Rose Mary Su
Staff Consultant

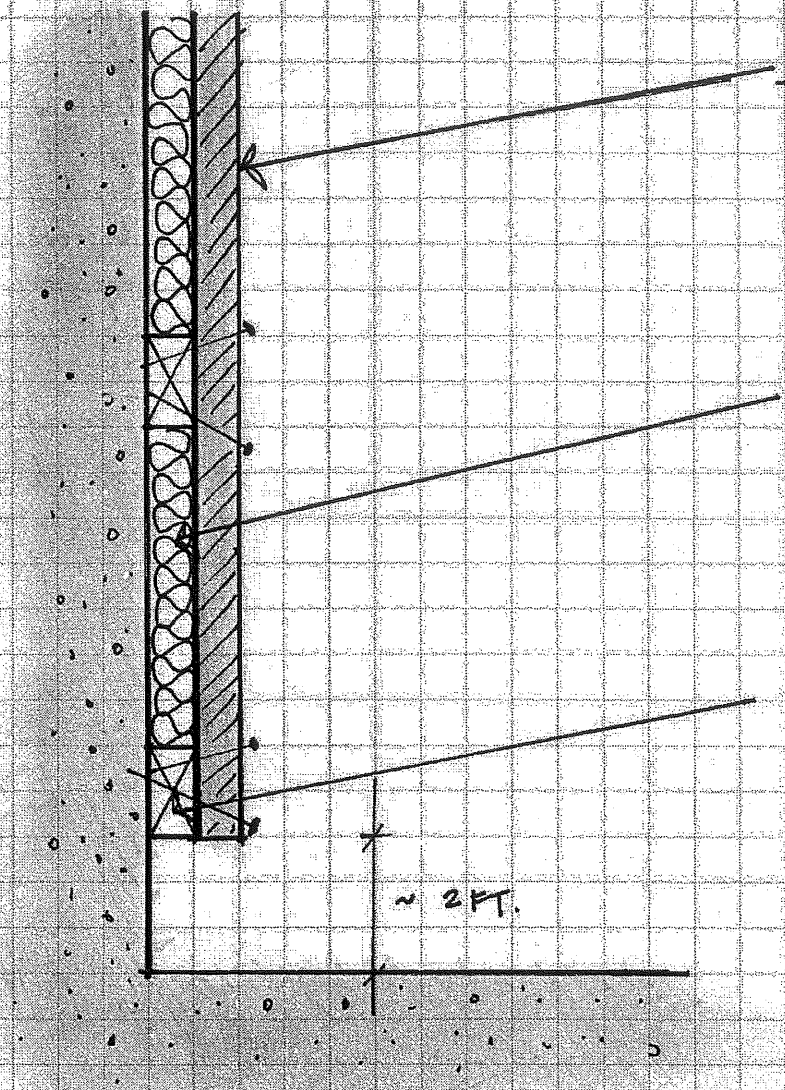
Gregory C. Tocci
Senior Consultant

RMS/gct/rms-03041-Maine Medical Center-Central Utility Plant-Env Noise Study and Rec 2

Appendix
Tables and Sketches

CAVANAUGH
TOCCI
ASSOCIATES, INCORPORATED
327 F BOSTON POST ROAD, SUDBURY, MA 01776
TELEPHONE (978) 443-7871
FAX (978) 443-7873

JOB TRO - MAINE MEDICAL CENTER
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE NTS



SK. 2 EMERG. GEN. ROOM WALL TREATMENT

MAINE MEDICAL CENTER - CENTRAL UTILITY PLANT

Study Location	Total without Emergency Generators	Total with one Emergency Generator	Total with two Emergency Generators	Portland Nighttime Limit	Portland Daytime Limit	Emergency Generator 1 Room Intake	Emergency Generator 2 Room Intake	Emergency Generator 1 Discharge	Emergency Generator 2 Discharge	Emergency Generator 1 Exhaust	Emergency Generator 2 Exhaust	Boiler Room Inlet (AHU-1)	Boiler Room Relief Louver	Chiller Room Inlet (AHU-2)	Chiller Room Exhaust	Cooling Tower 1A & 1B	Cooling Tower 2A & 2B	Cooling Tower 3A & 3B	EF-2 Roof Exhaust Fan
1	42	47	55	**55**	**60**	30	31	46	54	25	26	<20	<20	<20	<20	34	38	38	34
2	51	54	55	**55**	**60**	48	47	45	47	36	36	29	35	20	<20	46	47	47	34
3	51	52	53	**55**	**60**	42	42	41	45	34	33	32	31	23	<20	47	46	45	35

Table 2. Estimated sound levels produced by Central Utility Plant mechanical equipment at study locations.

Section 6

Visual Quality and Scenic Character

Visual Quality and Scenic Character

The project site is located on Congress, Wescott, Charles, Ellsworth, Gilman and Crescent Streets in Portland. Existing development of the Maine Medical Center property includes various hospital buildings and associated paved parking and landscaped areas, the majority of this area is comprised of impervious rooftop and pavement surfaces.

The Charles Street addition has been designed to match the existing Maine Medical Center architecture. The proposed addition utilizes clay brick and accent materials which are in harmony with the existing hospital. In addition, extensive public sidewalks and new landscaping will enhance the character and pedestrian safety in the area.

Detailed landscape design has been incorporated into all aspects of this project to enhance the visual quality of this project and to minimize the visual impact of the development to the surrounding area.

The development proposal consists solely of hospital use facilities. The proposed project is not located within an area identified as significant scenic character.

Section 7

Wildlife and Fisheries

Wildlife and Fisheries

We have sent a letter to the Department of Inland Fisheries and Wildlife requesting a formal determination as to the presence of any essential, significant or special concern habitat in the immediate area of the project site. A copy of that letter is attached. The Department of Inland Fisheries and Wildlife's response letter will be forwarded once it is received

Sebago Technics
Engineering Expertise You Can Build On

sebagotechnics.com
One Chabot Street
P.O. Box 1339
Westbrook, Maine
04098-1339
Ph. 207-856-0277
Fax 856-2206

November 24, 2003
01046

Mr. Warren Eldridge
Maine Department of Inland Fisheries & Wildlife
358 Shaker Road
Gray, ME 04039

Inland Fisheries & Wildlife Review
Maine Medical Center Expansion, Portland, Maine

Dear Mr. Eldridge:

Maine Medical Center is planning the redevelopment and expansion of its Bramhall Street Campus. This area is bounded by Congress, Gilman, Bracket, Ellsworth, Wescott, Bramhall, and Crescent Streets in Portland.

The proposed project will include the construction of a central utility plant, a six-story hospital building, a parking garage, and various infrastructure improvements throughout the hospital campus.

In order to fulfill the requirements of the City of Portland, I am requesting a formal determination as to the presence of any essential wildlife or fisheries habitats in the immediate vicinity. To assist in your review, I have attached a USGS location map and a sketch of the proposed areas of redevelopment. Please feel free to call me at 856-0277 if you have any questions or require any additional information. Thank you for your attention to this matter.

Sincerely,

SEBAGO TECHNICS, INC.

Anthony P. Panciocco
Design Engineer

APP:app/jc
Enc.

cc: Hank Dunn

Section 8

Historic Sites

Section 8

Historic Sites

The Maine Historic Preservation Commission has been contacted regarding the presence of any historic properties that may be affected by the project. The attached letter from the Commission states that the project will have no effect upon historic resources.

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

ANGUS S. KING, JR.
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

December 16, 2003

Anthony P. Panciocco
Design Engineer
Sebago Technics
1 Chabot Street
P.O. Box 1339
Westbrook, ME 04098-1339

Project: MHPC #2599-03 - Maine Medical Center; Bramhall Street Campus; #01046
Location: Portland, ME

Dear Mr. Panciocco:

In response to your recent request, I have reviewed the information received November 26, 2003 to initiate consultation on the above referenced project. This project was reviewed pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended.

Based on the location and scope of work, I have concluded that this project will have no effect upon historic properties [architectural or archaeological].

Please contact Mike Johnson of my staff if we can be of further assistance in this matter.

Sincerely,

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

EGS/mj

Section 9

Unusual Natural Areas

Section 9

Unusual Natural Areas

There are no rare botanical features within the proposed project area. Please see the attached response letter from the Maine Natural Heritage Program.

STATE OF MAINE
DEPARTMENT OF CONSERVATION
157 HOSPITAL STREET
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0093

JOHN ELIAS BALDACCI
GOVERNOR

PATRICK K. MCGOWAN
COMMISSIONER

December 2, 2003

Anthony P. Panciocco
Design Engineer
Sebago Technics
One Chabot Street
Westbrook, ME 04098-1339

Re: Rare and exemplary botanical features, Maine Medical Center Expansion, Portland.

Dear Mr. Panciocco:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request of November 24, 2003 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in the City of Portland, Maine. Rare and unique botanical features include the habitat of rare, threatened or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as

MAINE NATURAL AREAS PROGRAM
MOLLY DOCHERTY, DIRECTOR

PHONE: (207) 287-8044
FAX: (207) 287-8040
TTY: (207) 287-2213

well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $75.00 for our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Toni Bingel Pied

Toni Bingel Pied
GIS Specialist/Assistant Ecologist
93 State House Station
Augusta, ME 04333-0093
207-287-8044
toni.pied@maine.gov

Enclosures

Rare or Exemplary Botanical Features in the Project Vicinity

Documented within a four mile radius of the proposed Maine Medical Center Expansion, Portland.

Scientific Name Common Name	Last Seen	State Rarity	Global Rarity	State Legal Status	Federal Legal Status	Habitat Description
ADLUMIA FUNGOSA ALLEGHENY VINE	1860	S1	G4	T		Wet or recently burned woods, rocky wooded slopes.
ALLIUM CANADENSE WILD GARLIC	1921	S2	G5	SC		Alluvial woods, thickets, and meadows.
ALLIUM TRICOCCUM WILD LEEK	1991	S3	G5	SC		Rich hardwood forests, usually alluvial.
ARABIS MISSOURIENSIS MISSOURI ROCKCRESS	1905	S1	G4G5Q	T		Circumneutral bluffs, ledges or rocky woods.
ASPLENIUM PLATYNEURON EBONY SPLEENWORT	1910	S2	G5	SC		Rich partly forested slopes, rocky ledges, and dry, circumneutral outcrops.
AUREOLARIA PEDICULARIA FERN-LEAVED FALSE FOXGLOVE	1902	S3	G5	SC		Dry deciduous woods and clearings.
CAREX POLYMORPHA VARIABLE SEDGE	1911	S1	G3	E		In Maine, habitat is between downslope seeps (with horsetails and wetland sedges) and upslope mixed oak/huckleberry forest. Preferred soil type is Deerfield Loamy Sand. All Maine occurrences are from coastal towns where climate is moderated by the ocean.
CAREX RECTA SALT-MARSH SEDGE	1913	S1	G4	T		Saltmarshes and coastal shores.

Rare or Exemplary Botanical Features in the Project Vicinity

Documented within a four mile radius of the proposed Maine Medical Center Expansion, Portland.

Scientific Name Common Name	Last Seen	State Rarity	Global Rarity	State Legal Status	Federal Legal Status	Habitat Description
CAREX STERILIS DIOECIOUS SEDGE	1936	S2	G4	T		Wet calcareous soils.
CHIMAPHILA MACULATA SPOTTED WINTERGREEN	1991	S2	G5	E		Dry woods.
ELEOCHARIS ENGELMANNII ENGELMANN'S SPIKERUSH	1916	SH	G4?	PE		Wet sand, peat or mud
ELYMUS HYSTRIX BOTTLEBRUSH GRASS	1905	S2	G5	T		Rich, rocky, or alluvial deciduous forests.
ERIOCAULON PARKERI PARKER'S PIPEWORT	1924	S3	G3	SC		Fresh to brackish tidal mud and estuaries.
HIPPURIS VULGARIS COMMON MARE'S-TAIL	1924	S3	G5	SC		Shallow, quiet water, or seldom on mud
LOBELIA SIPHILITICA GREAT BLUE LOBELIA	1905	SX	G5	PE		Rich low woods and swamps
LONICERA DIOICA MOUNTAIN HONEYSUCKLE	2002	S1?	G5	E		Rocky banks, dry woods and thickets.

Rare or Exemplary Botanical Features in the Project Vicinity

Documented within a four mile radius of the proposed Maine Medical Center Expansion, Portland.

Scientific Name Common Name	Last Seen	State Rarity	Global Rarity	State Legal Status	Federal Legal Status	Habitat Description
PHEGOPTERIS HEXAGONOPTERA BROAD BEECH FERN	1872	S2	G5	SC		Rich, often rocky, hardwood forests.
PLATANTHERA FLAVA PALE GREEN ORCHIS	1907	S2	G4T4Q	SC		Swampy woods, bottomlands, swales, and wet shores.
POLYGALA CRUCIATA MARSH MILKWORT	1903	SH	G5T4	PE		Wet pinelands, savannas, peats, and sands.
POTAMOGETON VASEYI VASEY'S PONDWEED	1901	S1	G4	T		Quiet muddy or calcareous waters.
PROSERPINACA PECTINATA COMB-LEAVED MERMAID-WEED	1906	S1	G5	SC		Sandy bogs of the coastal plain
PRUNUS MARITIMA BEACH PLUM	1933	S1	G4	E		Sandy soil along or near the coast.
RANUNCULUS AMBIGENS WATER-PLANTAIN SPEARWORT	1862	SH	G4	PE		Sloughs, ditches, and muddy swamps.
SAXIFRAGA PENSYLVANICA SWAMP SAXIFRAGE	1913	S3	G5	T		Wet meadows, swamps, boggy thickets, and seeping banks.

Rare or Exemplary Botanical Features in the Project Vicinity

Documented within a four mile radius of the proposed Maine Medical Center Expansion, Portland.

Scientific Name Common Name	Last Seen	State Rarity	Global Rarity	State Legal Status	Federal Legal Status	Habitat Description
SELAGINELLA APODA CREEPING SPIKE-MOSS	1924	S1	G5	E		Meadows, lawns, and streambanks.
SUAEDA CALCEOLIFORMIS AMERICAN SEA-BLITE	1932	S1	G5	T		Rocky or gravelly saltmarshes and sea-strands.
TRIOSTEUM AURANTIACUM WILD COFFEE	1910	S1	G5	E		Rich woods and thickets.
VIOLA PALMATA PALMATE-LEAVED VIOLET	1908	SH	G5	PE		Rich deciduous woods, shaded calcareous ledges, etc.
WOLFFIA COLUMBIANA COLUMBIA WATER-MEAL	2002	S2	G5	T		Ponds, and still waters.
ZANNICHELLIA PALUSTRIS HORNED PONDWEED	1972	S2	G5	SC		Fresh, brackish or alkaline waters, and stream edges.

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (on the order of 20-100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

SH Occurred historically in Maine, and could be rediscovered; not known to have been extirpated.

SU Possibly in peril in Maine, but status uncertain; need more information.

SX Apparently extirpated in Maine (historically occurring species for which habitat no longer exists in Maine).

Note: **State Ranks** determined by the Maine Natural Areas Program.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

G3 Globally rare (on the order of 20-100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.

Note: **Global Ranks** are determined by The Nature Conservancy.
T indicates subspecies rank, **Q** indicates questionable rank, **HYB** indicates hybrid species.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's endangered and threatened plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.

T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

PE POSSIBLY EXTIRPATED; Not known to currently exist in Maine; not field-verified (or documented) in Maine over the past 20 years.

FEDERAL STATUS

LE Listed as Endangered at the national level.

LT Listed as Threatened at the national level.

Please note that species names follow Flora of Maine: A Manual for Identification of Native and Naturalized Vascular Plants of Maine, Arthur Haines and Thomas F. Vining, 1998, V.F. Thomas Co., P.O. Box 281, Bar Harbor, Maine 04069-0281.

Where entries appear as binomials, all representatives (subspecies and varieties) of the species are rare in Maine; where names appear as trinomials, only that particular variety or subspecies is rare in Maine, not the species as a whole.

Visit our web site for more information on rare, threatened and endangered species!
http://www.state.me.us/doc/nrimc/mnap/factsheets/mnapfact.htm

Section 10

Buffers

Buffers

There are no buffers proposed for the development of this site.

Section 11

Soils

Section 11

Soils

A. Soil Survey Map

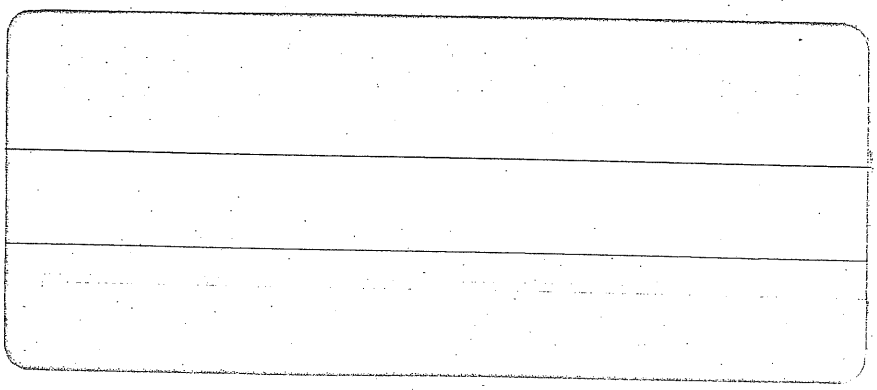
Soil classifications within the project area were referenced from the Cumberland County Medium Intensity Soil Survey. The site is primarily comprised of Hinckley soils. For modeling purposes, the soils were considered hydraulic soil Groups A. Figure 2 attached consists of the appropriate map from the Cumberland County Medium Intensity Soil Survey with the project site identified.

B. Geotechnical Investigation

Attached with this submission is a Preliminary Geotechnical Engineering Report and exploration location plan prepared by S. W. Cole Engineering, Inc.

C. Hydric Soils Mapping

There are no wetland areas associated with this site.



S.W.COLE
ENGINEERING, INC.

● *Geotechnical Engineering* ● *Field & Laboratory Testing* ● *Scientific & Environmental Consulting*

COPY

DRAFT

GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED MEDICAL OFFICE
BUILDING AND PARKING GARAGE
WOMEN AND INFANTS FACILITY
CHARLES STREET
PORTLAND, MAINE

01-0304.1 **MARCH 29, 2002**

TABLE OF CONTENTS

DRAFT

01-0304.1

March 29, 2002

Maine Medical Center
Attn: Hank Dunn
22 Bramhall Street
Portland, Maine 04102-3175

Subject: Geotechnical Engineering Investigation
Proposed Building Addition-Medical Office Building and Parking Garage
Women and Infants Facility
Charles Street
Portland, Maine

In accordance with our Proposal dated December 11, 2001, we have made a geotechnical investigation for the proposed building addition at the Maine Medical Center Facility in Portland, Maine. The purpose of the work was to obtain subsurface soils information in order to provide general geotechnical recommendations for foundations and earthwork associated with the proposed construction. The contents of this report are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope of Services

S. W. COLE ENGINEERING, INC. coordinated an exploration program consisting of seven test borings, provided soils laboratory testing, and made a geotechnical evaluation of the finding as they relate to the proposed construction. Geotechnical data from previous test borings (1965 and 2001) was considered in our evaluation.

S. W. COLE ENGINEERING, INC. physically located the test borings in the field based on preliminary information provided by Maine Medical Center and design team. The drilling company contacted DigSafe to clear certain public utilities. The drilling firm to clear utilities at the exploration locations subcontracted a private utility locating company. Additionally, a detail officer (Portland Police) was subcontracted by S. W. COLE ENGINEERING, INC. for traffic and pedestrian control during drilling.

Our geotechnical evaluation has included assessment of the following:

- Soil Bearing Capacity
- Site Seismic Soil Coefficient (Boca 1999)
- Soil Subgrade Modulus
- Frost Penetration Depth
- Subgrade Preparation
- Foundation and Sub-Slab Drainage
- Lateral Earth Pressure Coefficients
- Backfill and Compaction Requirements
- Depths to Groundwater and Refusal (if encountered)
- General discussion of Excavation Work and Dewatering
- Recommended Pavement Structure
- The effects of lowering the site groundwater on the adjacent structure
- Recommendations for Additional Study, if needed

We understand others will provide the actual design of foundations as well as temporary and permanent bracing, shoring and underpinning.

1.2 Proposed Construction

Based on conversations and information provided by TRO Architecture (project architect) and Simpson Gumpertz & Heger, Inc (SGH, Inc.- project structural engineer), we understand the project calls for the construction of a seven level structure that will encompass a footprint of about 33,000 SF (plan view). The structure will have two levels of below grade parking, four levels of above grade medical office space and a rooftop mechanical penthouse level. We understand that design will also accommodate two future levels above the mechanical penthouse level.

Based on conversations with the project structural engineer and preliminary foundation plans, we understand the new structure will be constructed adjacent to the easterly side of the existing Richards Wing with a portion of the building spanning over an existing below-grade electrical vault. The building structure will generally be about 120 by 240 feet in plan dimension. Construction will require the relocation/re-construction of Charles, Ellsworth and Wescott Streets (currently situated adjacent to the Richards Wing). An existing multi-story Medical Office Building (New England Rehabilitation Hospital) currently exists on the easterly side of Charles Street and will be razed to allow for the new construction.

in plan dimensions. Base on our observations and information shown on a site plan provided by Sebago Technics, the existing NERH structure has 3 levels on the southerly side and 4 levels on the northerly side. The additional level on the northerly side is a walk out basement level at about elevation 136 feet. Logs of borings B-1 through B-5 are attached as Appendix B.

2.1.3 2002 Investigation

Seven Borings (B-101 through B-107) were made during the period of January 30, 2002 through February 6, 2002 at the site of the proposed addition. An eighth Boring (B-108) was made during the period of February 8, 2002 through February 11, 2002 for a preliminary investigation of a proposed parking garage to be constructed approximately 60 LF northwest of the proposed Women and Infants Addition. We have included the information obtained at this boring as part of this report.

Great Works Test Borings, Inc. of Rollinsford, NH made the explorations working under subcontract to S. W. COLE ENGINEERING, INC. The exploration locations were selected by S. W. COLE ENGINEERING, INC. based on project information provided by SGH, Inc. and Maine Medical Center, information obtained at Borings B-1 through B-5 (made previously) as well as existing structures and subsurface utilities. The approximate locations of the 2001 and 2002 explorations are shown on Sheet 1. Logs of Borings B-101 through B-107 are attached as Sheets 2 through 15. A key to the notes and symbols used on the logs are attached as Sheet 16. The boring log for Boring B-108 and associated grain size analyses are attached as Appendix C. The ground surface elevations shown on the logs were determined by interpolation of topographic information shown on Sheet 1.

2.2 Laboratory Testing

Laboratory testing was performed on selected samples recovered during drilling. The results of 20-gradation analyses are attached as Sheets 17 through 23. Moisture content and Atterberg Limit Test Results are shown on the log sheets. Two bulk soil samples from Boring B-105 were made by combining nearby samples: B-105 combination A (S-5, S-6 and S-7) and B-105 combination B (S-8, S-9 and S-11). These combined samples were tested for moisture content, grain size analyses, Atterberg Limits and direct shear. Graphical results of direct shear testing are attached as Sheets 24 through 25. We also made an approximation of in-situ wet soil density for B-105 combination A and B using soil material retrieved from a split spoon sampler. B-105 combination A was estimated to be on the order of 135 pcf while B-105 combination B was estimated to be on the order of 141 pcf.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The site of the proposed addition is situated on the northeasterly side of the Richards Wing of the existing hospital facility. Charles, Ellsworth, Wescott and Crescent Streets, as well as the existing New England Rehabilitation Hospital (NERH) building and associated paved parking areas currently occupy the site. Based on information shown on Sheet 1, the site slopes downward generally from south to north from about elevation 141 to 125 feet (project datum). The elevation of the basement portion of the NERH building is on the order of 126 feet while the first floor is about 136 feet. This structure is within the proposed addition footprint.

An electrical vault exists adjacent to the easterly side of the Richards Wing. The vault appears to be founded on spread footings and is about 55 by 23 feet in plan dimensions (longest dimension adjacent to the Richards Wing) with a finish floor elevation of about 128 feet, which is on the order of 10 feet below Charles Street elevation.

Based on information provided by SGH, Inc., the Richards Wing is founded on large spread footings at about elevation 123 to 124 with a basement level floor at elevation of about 130 feet. The first floor elevation is on the order of 143.5 feet.

3.2 General Site Geology

Published mapping (Prescott) indicates that this area of Portland is characterized by a generally flat-topped knoll with an elevation of about 140 feet. Stratigraphy encountered includes surficial granular fill overlying dense glacial till.

An ice-contact deposit is mapped west of and adjacent to the till knoll. Previous explorations by the Maine Department of Transportation found a deep valley in the bedrock beneath the Fore River located to the south and west of the knoll, with bedrock at elevations below 20MSL.

3.3 Subsurface Conditions

Below a surficial layer or asphalt of topsoil, the explorations encountered a soil profile consisting of granular fill overlying native glacial till. The granular fill was found to be loose to dense, consisting primarily of sand with varying amounts of silt and gravel and occasional cobbles. Pieces of construction debris such as brick were observed in some samples of the fill. Although the fill varies in thickness from about 1 to 14 feet at the explorations, the majority of the borings encountered about 8 to 10 feet of fill. Below the

fill exists a native deposit of medium dense to very dense glacial till. The glacial till consists primarily of silt and sand with some gravel and a trace to some clay with occasional cobbles.

Borings B-1 through B-5, made for the preliminary phase investigation, extended to depths varying from about 24 to 39 feet below the existing ground surface. Borings B-2 and B-4 encountered refusal surfaces (probable cobbles or boulder) at depths of 30.5 and 24.0 feet below the existing ground surface. Borings B-1, B-3 and B-5 were terminated in the dense glacial till.

Borings B-101 through B-108, made for this phase of work were made to depths varying from 52 to 102 feet below the existing ground surface. These borings did not encounter refusal surfaces. Borings B-101 and B-107 were made within about 5 feet of Borings B-2 and B-4, respectively in order to assess the refusal surfaces met during the preliminary phase. Based on the findings, it appears that the refusal surfaces were likely boulders or nested cobbles.

The following chart indicates the approximate fill thickness, depths and elevations of borings.

Boring No.	Approximate Ground Elevation (ft)	Approximate Bottom of Boring Depth/Elev. (ft)	Approximate Fill Thickness (ft)	Approximate Elevation of Top of Native Till	Groundwater Piezometer Installed
B-1	138.0	39.0 / 99.0	10.0	128.0	
B-2	140.0	30.5 / 109.5	10.5	129.5	Yes
B-3	135.0	39.0 / 96.0	6.5	128.5	
B-4	129.5	24.0 / 105.5	1.0	128.5	
B-5	125.5	37.0 / 88.5	8.0	117.5	
B-101	140.0	62.0 / 78.0	9.5	130.5	
B-102	140.0	72.0 / 68.0	9.0	131.0	
B-103	138.0	62.0 / 76.0	9.0	129.0	
B-104	129.0	52.0 / 77.0	14.0	128.0	Yes
B-105	138.0	72.0 / 66.0	13.0	125.0	Yes
B-106	137.0	62.0 / 75.0	8.5	128.5	
B-107	130.0	62.0 / 68.0	5.2	124.8	Yes
B-108	120.0	102.0 / 18.0	15.0	105.0	Yes

Refer to the attached boring logs for a more detailed description of the subsurface conditions.

3.4 Groundwater

Based on observation of collected soil samples and moisture content testing, the granular fills overlying the glacial till were generally moist to damp. Moisture content testing indicates that the underlying glacial till is consistent in water content (10± percent), but is saturated. The relatively low moisture content test results for the till are related to the high density of the till and the lack of rounding in the soil particles which allows dense packing and a low porosity.

One-inch diameter groundwater observation piezometers were installed in Borings B-2, B-104, B-105 and B-107. A group of three nested piezometers were installed at Boring B-108. Details of piezometer installation and readings made to date are attached as Sheets 26 through 32.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the findings at the explorations, the proposed construction appears feasible from a geotechnical standpoint. Although the native glacial till varies in density throughout the depth explored, the native undisturbed glacial till will provide adequate support of the proposed structure on spread footing foundations provided the subgrade is protected from disturbance. Construction dewatering will be needed in order to control groundwater seepage from excavation sidewalls. Based on the soil conditions encountered, we do not anticipate any detrimental impact on the adjacent structure as a result of lowering the groundwater level at the site for construction and long-term drainage.

The lower level parking garage slab will need to be protected from frost heave by providing at least 4 feet of clean, non-frost susceptible soil or a lesser thickness of clean fill in combination with subgrade insulation. Sub-slab and peripheral foundation drainage will be needed. The existing fills and native till soils are frost susceptible and should not be utilized as foundation backfill in areas exposed to freezing temperature.

4.2 Spread Footings

We recommend that all foundation subgrades be protected with a 3 to 4 inch thick layer of concrete (mud mat) with a minimum compressive strength of 2000 psi. Foundations should be designed considering an allowable bearing contact pressure of 5 ksf or less. The design freezing index for the Portland, Maine area is on the order of 1250-Fahrenheit degree-days.

Thus, a frost penetration depth of 4.5 feet should be anticipated from all surfaces exposed to freezing temperatures. All foundations should be placed at least 4.5 feet from finish slab or ground grades unless protected by subgrade insulation. We recommend that foundation design consider the following parameters:

- Allowable Soil Bearing Contact Pressure = 5 ksf or less (undisturbed glacial till)
- Base Friction Factor = .55 (mass concrete to glacial till)
- Frost Penetration/Depth = 4.5 feet
- Passive Lateral Earth Pressure Coefficient (Kp) = 3.8 (undisturbed glacial till)
- Passive Lateral Earth Pressure Coefficient (Kp) = 3.0 (compacted select fill)

Relative to seismic design, we interpret the subsurface conditions beneath the proposed building addition to correspond to a Soil-Profile Type S_1 and Site Coefficient of 1.0 (BOCA 1999). For footings founded on undisturbed subgrades, we do not anticipate post-construction settlements in excess of ½-inch.

4.3 Below Grade Foundation Walls

Foundation wall design should consider the following parameters:

- Passive Lateral Earth Pressure Coefficient (Kp) = 3.0 (compacted select fill)
- At-Rest Lateral Earth Pressure Coefficient (Ko) = 0.50 (compacted select fill)
- Active Lateral Earth Pressure Coefficient (Ka) = 0.33 (compacted select fill)

These design parameters assume that clean, compacted, non-frost susceptible, free-draining granular-fill with an internal friction angle of at least 30° is utilized as backfill. Retaining walls, which are restrained to rotation, should be designed considering the at-rest pressure coefficient.

These design values do not account for lateral surcharge loads from construction related activities such as compaction equipment, footings located within a 1H to 1V plane behind the proposed walls or lateral loads due to wedging of backfill soils. The structural engineer should assess lateral loading both during construction and long term. We can assist with geotechnical parameters for these situations as foundation plans are developed.

4.4 Slab-on-Grade Floors

Concrete slab-on-grade floors for heated building areas may be designed using a subgrade reaction modulus of 250 pci (pounds per cubic inch) provided that the slab is underlain by at least 12 inches of compacted select fill overlying dense subgrade. In unheated slab areas, the thickness of granular base below on-grade slabs should be increased or should be combined with subgrade insulation to protect against vertical displacement and damage due to frost action. The granular base should consist of clean granular fill meeting the gradation requirements for Select Fill (Section 4.7).

It should be noted that protection against frost action is particularly critical in situations with limited overhead clearance, such as in parking garages. The on-grade concrete slab of the parking garage is underlain by frost-susceptible native soils and will be exposed to freezing temperatures. Given these conditions, we recommend the following options for slab support, sub-slab drainage, and mitigation of potential frost heave beneath unheated concrete slab areas:

- Option 1 – Full Depth Non-Frost Susceptible Soils. Assuming a 5-inch thick concrete parking slab, we recommend the slab be underlain with a 4 foot thickness of clean non-frost susceptible material consisting of compacted select fill and crushed stone (see Section 4.6) placed on stable subgrade soil.

- Option 2 – Insulation. Assuming a 5-inch thick concrete parking slab, we recommend the slab be underlain with 12 inches of compacted Select Fill overlying 2 inches of rigid, extruded, closed-cell, polystyrene insulation overlying at least 12 inches of crushed stone (see Section 4.6) placed on stable subgrade soils. Heavy equipment should not operate on the select fill and insulation once placed.

For heated and unheated on-grade slab areas, the select fill and crushed stone should be hydraulically connected to the foundation and sub-slab drainage systems. Additionally, utilities sensitive to freezing should be isolated from on-grade floor slabs and should be buried below the design frost depth or insulated for protection against frost damage.

We recommend that design consider a vapor retarder installed beneath floor slabs in areas covered with moisture sensitive flooring. The vapor retarder should have a permeance that is less than the floor covering being applied on the slab and should be

installed according to the manufacturer's requirements. Flooring suppliers should be consulted relative to acceptable vapor retarder systems for use with their products.

We recommend that contraction joints be installed in floor slabs to accommodate shrinkage in the concrete as it cures. Contraction joints are typically installed at 10 to 15 foot spacing, but should be determined by the structural engineer with consideration to slab thickness and other factors. We recommend that floor slabs be wet-cured for a period of at least 7 days after casting as a measure to reduce the potential for curling of the concrete and excessive drying/shrinkage. We further recommend that consideration be given to using curing paper installed over the cast-in-place concrete and that the curing paper remain in place as long as possible to improve the quality of the completed floor. In lieu of curing paper, a quality-curing compound should be utilized; however, care must be taken to prevent scuffing of the compound from the floor.

4.5 Foundation Drainage

We recommend that peripheral exterior and interior foundation drains be provided at footing grade for the structure. Additionally, we recommend that several sub-slab underdrain lines be placed below the on-grade parking slab. An underdrain line should be provided at elevator pit areas as well. The foundation drains should be placed at least 4.5 feet from freezing temperatures (unless subgrade insulation is utilized) and should consist of 4-inch diameter rigid underdrain pipe having perforations of ¼ to ½ inches. We recommend that at least 6 inches of crushed stone bedding be provided around the foundation drains and that the stone be wrapped with a geotextile filter fabric having an apparent opening size of at least 70. The foundation drainage system must have a positive gravity outlet. Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that are not to be paved or occupied by entrance slabs to reduce direct surface water infiltration into the backfill. Roof drains should be routed in separate non-perforated pipes, also placed below the frost depth.

4.6 Excavation Work

An erosion control system should be provided prior to excavation activity at the site to protect adjacent drainageways. We recommend that site preparation begin with the removal of existing utilities, pavement, topsoil and surficial soils containing organics and existing fills beneath the proposed building addition. As much vegetation/pavement should remain in other areas to help lessen the potential for erosion.

Excavation work will generally encounter granular fill overlying glacial till consisting of silt and sand with varying amounts of gravel and clay and cobbles. The fine-grained glacial till can undergo strength loss when subjected to construction traffic and excavation activities.

Care must be exercised during construction to limit disturbance of the bearing soils during excavation work. While it is common to use excavation equipment with ripping and digger buckets, we recommended that consideration be given to using a smooth-edged bucket for final excavation and finish grading of subgrades in the fine-grained soils to help limit subgrade disturbance. Construction equipment should not operate directly on the native subgrade soils. As discussed in section 4.2, footing subgrades should be protected with concrete mud mats. Should the foundation subgrade become soft or difficult to work, the subgrade should be over-excavated and backfilled with concrete. We recommend that a working mat consisting of ¾ inch crushed stone be placed beneath the entire building footprint (except foundation areas) to provide a stable working surface and to protect the native soil subgrade. A geotextile fabric should be used on the subgrade soils to separate the crushed stone from the fine-grained subgrade soil. Consideration should be given to pumping concrete for foundations and the slab-on-grade level in order to limit heavy vehicle traffic on the crushed stone and native soils.

The contractor should anticipate the need for dewatering in excavations. Ditching with gravity drainage and sumping and pumping should be adequate. Controlling the water levels to at least 1-foot below subgrade elevation will reduce disturbance of the subgrade soils and provide a more stable working surface during construction.

Based on the existing grades shown on Sheet 1 and anticipated excavation depths ranging from about 15 to 30 feet below existing grades for the on-grade parking level. Deeper cuts are anticipated for foundations. We anticipate that a combination of braced and open excavations may be utilized. Excavations should be sloped or properly shored to prevent undermining of existing foundations and adjacent pavement as well as sloughing and caving of the excavation sidewalls during construction. Temporary unsupported soil excavations should be cut to a slope of 1 ½ H on 1V or flatter. Temporary slopes should be protected from erosion placing diversion berms at the head of the slope and covering the slope with plastic sheeting. All excavations should be consistent with the OSHA trenching regulations.

4.7 Backfill and Compaction

The on-site fill soils and native glacial till are frost susceptible and not well-drained. Consequently, these soils are not suitable for reuse as foundation or basement/retaining wall backfill. Backfill placed adjacent to all foundations, both inside and outside, should be compacted select fill. At least 4.5 feet (horizontal measure) of Select Fill should be placed against foundation/retaining walls that are exposed to freezing temperatures. In areas not subjected to freezing temperatures, at least 2.0 feet (horizontal measure) of Select Fill should be placed behind basement/retaining walls and should connect to the foundation drain system to avoid the build-up of hydrostatic pressures behind the walls. Select Fill and Crushed Stone used beneath structures and against concrete walls should meet the following gradation requirements.

Sieve Size	Percent Finer By Weight	
	Select Fill	Crushed Stone
4 inch	100	---
3 inch	90 -100	---
1 inch	---	100
3/4 inch	---	90 - 100
3/8 inch	---	20 - 55
1/4 inch	25 – 90	---
#4	---	0 – 10
#8	---	0 – 8
#40	0 – 30	---
#200	0 – 5	---

Sub-slab fill and any fill placed below structures should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Foundation backfill should be compacted to at least 95 percent beneath paved areas, entrance slabs and adjacent sidewalk areas. Backfill against basement/retaining walls should be compacted to between 92 to 95 percent of ASTM D-1557 using hand operated equipment to help limit lateral earth pressures. Over-compaction of wall backfill and the use of heavy compaction equipment behind basement walls will induce additional lateral stresses on the wall.

4. 8 Pedestrian Tunnel

We understand that concept plans call for a 10± foot wide subsurface tunnel structure between the proposed Women and Infants building addition and the existing Leon L. Bean Wing of the existing Hospital which is located about 150 LF southeast of the proposed easterly addition corner. The tunnel will be situated beneath the existing

Emergency Room entrance and parking area. The existing parking area is at approximately elevation 128 feet. A concrete retaining wall exists along the northerly side of the existing parking area that separates the parking area and Crescent Street, which is about elevation 118 feet in this area. We understand the pedestrian tunnel will have a finish floor grade approximately 10 to 15 feet below existing pavement grade in order to access the basement of the Leon L. Bean Wing and proposed lower level (FFE=115.0) of the parking garage portion of the addition.

Borings B-4, B-107 and B-104 were made in the area of the tunnel. Borings B-4 and B-107 were made near the westerly end of the tunnel. These borings encountered 1 to 5± feet of loose granular fill overlying dense to very dense native gray glacial till. Boring B-104 was made near the easterly end of the proposed tunnel. This boring encountered about 14 feet of medium dense to dense brown silty sand with some gravel (glacial till fill) overlying native dense brown glacial till.

Groundwater observation piezometers were installed at Borings B-104 and B-107. Based on readings made to date, groundwater appears to be at depths of about 3.5 and 12.5 feet below the ground surface at these borings, respectively. The reason for the shallow groundwater readings at Boring B-104 is not known at this time, particularly since weep-holes are evident at the base of the adjacent retaining wall structure.

We anticipate that a braced excavation will be made to construct the tunnel structure. Groundwater will need to be controlled to at least 12 inches below subgrade elevation. We recommend that the tunnel base be over-excavated by at least 18 inches to allow 18 inches of a compacted crushed stone drainage layer wrapped with geotextile fabric. Perforated underdrain lines are needed within the crushed stone layer along the proposed tunnel wall lines. The underdrains must have a positive gravity outlet. Additionally, rigid insulation should be considered for the walls and roof to help reduce thermal conductivity, which can cause condensation on the interior walls. The tunnel should be backfilled with select fill up to bottom of pavement subbase gravel. Consideration should be given to providing a water barrier membrane for the structure.

4.9 Asphalt Pavements

Proposed traffic loading information was not made available to us at the time of this report; thus, we have provided the following proposed pavement sections based on our experience with similar facilities and certain geotechnical assumptions.

We offer the following new pavement sections for consideration:

FLEXIBLE (ASPHALT) PAVEMENTS			
	Standard Duty	**Heavy Duty**	**Maine DOT Standard Specification**
Wearing Course	1 ½"	1 ½"	9.5mm Hot Mix Asphalt
Binder Course	1 ½"	2½"	12.5mm Hot Mix Asphalt
Crushed Base	4"	6"	703.06 Base Aggregate Type A Crushed
Granular Subbase	12"	15"	703.06 Subbase Aggregate Type D

We have assumed that some paved areas will have only passenger vehicle loading (standard duty) while other areas will have delivery truck traffic (heavy duty). All pavement sections need to be placed on properly prepared subgrades. Design should be reviewed prior to actual construction once actual loading information is available (provided by others).

Since the native soils are frost susceptible, some frost heaving and distress of pavements must be anticipated unless all frost susceptible soils are removed to a depth of at least 4.5 feet below the pavement surface.

The recommended pavement structure does not account for support of construction equipment or temporary haul roads. Consequently, the site contractor should consider some contingency for use of geotextile fabrics and possibly deeper gravel or crushed stone sections to preclude adverse impacts to subgrades soils (as needed).

4.10 Weather Conditions

If foundation construction takes place during cold weather, subgrades, foundations, and floor slabs must be protected during freezing conditions. Concrete must not be placed on frozen soil and once placed, the concrete and soil beneath the structure must be protected from freezing. Further, the native fine-grained soils are moisture sensitive and as such subgrades will be susceptible to disturbance during wet weather and freeze/thaw cycles.

Consequently, site-work and construction activities should take appropriate measures to protect exposed subgrades from moisture, freezing temperatures and construction activity.

4.11 Additional Evaluation and Geotechnical Design Review

This project requires deep excavations needed adjacent to the existing structure and paved areas. As such, supplemental geotechnical engineering work and on site observations by S. W. COLE ENGINEERING, INC. will be needed during design and construction. It will be important that the structural engineer and contractor consider layout of foundations and excavations relative to shoring and underpinning requirements, to protect adjacent structures and roadways.

We recommend that periodic water level reading be made at the piezometers in order to develop a record of groundwater levels. Additionally, we recommend that field permeability testing at existing piezometers be done to evaluate the permeability of the glacial till.

It is strongly recommended that S. W. COLE ENGINEERING, INC. be provided the opportunity to review the site work and foundation design drawings to confirm that our assessment of the subsurface soil and groundwater conditions and recommendations have been appropriately interpreted.

5.0 CLOSURE

It is important that a S. W. COLE ENGINEERING, INC. representative should be on-site during construction to observe excavation work and subgrade soils. This is to observe compliance with the geotechnical engineering recommendations and to allow design changes in the even that subsurface conditions are found to differ from those anticipated prior to the start of construction.

Further, a quality assurance-testing program should be implemented during construction, to observe compliance with the design concepts, specifications, and recommendations. S. W. COLE ENGINEERING, INC. is available to provide field and laboratory testing services for construction.

Sincerely,

S. W. COLE ENGINEERING, INC.

Paul F. Kohler, P. E.
Vice President

CC: Joh Thomsen – Simpson, Gumpertz & Heger, Inc.
Tom Lam – TRO/The Ritchie Organization

PFK/cah

\\Swc_gray\SYS\Files\Projects\2001\01-0304.1_Maine Medical Center_Portland_Charles Street MOB\Investigation.doc

Attachment A
Limitations

This report has been prepared for the exclusive use of Maine Medical Center for specific application to the Proposed Medical Office Building and Parking Garage for the Women and Infants Facility on Charles Street in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless S. W. COLE ENGINEERING, INC reviews the changes.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-101
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/29/2002
DATE FINISH: 2/5/2002
ELEVATION: 140±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									2'	BROWN SANDY TOPSOIL
	S-1	24"	10"	3.0'	5	6	4	4	4.0'	BROWN GRAVELLY SAND SOME SILT (FILL) ~MEDIUM DENSE~
	S-2	24"	20"	7.0'	20	21	15	28	9.5'	BROWN GRAVELLY SAND TRACE SILT WITH FREQUENT COBBLES (FILL) ~DENSE~
OPEN HOLE	S-3	24"	20"	12.0'	42	26	41	47	13.0'	BROWN SILTY SAND SOME GRAVEL (TILL) ~VERY DENSE~
	S-4	24"	24"	17.0'	8	9	14	14		GRAY SILTY SAND SOME GRAVEL TRACE CLAY (TILL) ~MEDIUM DENSE~
	S-5	24"	24"	22.0'	11	13	18	19		~DENSE~
	S-6	24"	24"	27.0'	15	16	19	23		
	S-7	24"	24"	32.0'	6	6	18	12	31.5'	
	S-8	24"	24"	34.0'	11	10	18	24		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY(TILL) ~MEDIUM DENSE TO DENSE ~
	S-9	24"	24"	37.0'	6	9	19	14		~MEDIUM DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-101

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-101
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/29/2002
DATE FINISH: 2/5/2002
ELEVATION: 140±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	24"	42.0'	6	10	14	16		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~DENSE~
	S-11	24"	10"	47.0'	10	14	19	19		
	S-12	24"	24"	52.0'	16	19	23	20		
	S-13	22"	22"	56.8'	7	12	15	50/3"	56.8'	
									58.0'	PROBABLE BOULDER
	S-14	24"	24"	62.0'	15	11	13	18	62.0'	~MEDIUM DENSE~
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-101

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-102
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/30/2002
DATE FINISH: 1/30/2002
ELEVATION: 140±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									0.2'	ASPHALT PAVEMENT
	S-1			3.0'	AUGER CUTINGS					BROWN GRAVELLY SAND SOME SILT(FILL) ~ MEDIUM DENSE ~
	S-2	6"	6"	5.5'	22	25/0"				W=5.0%
									9.0'	
OPEN HOLE	S-3	24"	24"	12.0'	15	20	23	27		BROWN SILTY SAND SOME GRAVEL (TILL) W=11.2% ~DENSE~
									15.0'	
	S-4	24"	0"	17.0'	10	11	13	14		GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) ~MEDIUM DENSE~
	S-5	24"	17"	22.0'	14	12	22	21		~ DENSE ~ W=9.0%
	S-6	24"	15"	27.0'	38	24	28	30		~ VERY DENSE ~
	S-7	24"	13"	32.0'	13	18	27	30		W=12.0%
	S-8	24"	24"	34.0'	10	12	18	21		
	S-9	24"	18"	37.0'	9	23	21	32		~ DENSE ~ W=9.2%
									39.0'	

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-102

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-102
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/30/2002
DATE FINISH: 1/30/2002
ELEVATION: 140±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	20"	42.0'	6	7	11	14		GRAY SILT AND SAND SOME GRAVEL SOME CLAY (TILL) ~MEDIUM DENSE~ W=22.3%
									44.0'	
	S-11	24"	22"	47.0'	7	12	24	28		GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) ~DENSE~ W=11.6%
	S-12	24"	12"	52.0'	13	18	23	31		
	S-13	24"	4"	57.0'	9	13	19	21		W=13.5%
									58.0'	
	S-14	24"	24"	62.0'	7	12	11	17	62.5'	CLAYEY SANDY SILT SOME GRAVEL (TILL) ~MEDIUM DENSE~ W=23.8%
										GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~DENSE~
	S-15	24"	24"	72.0'	14	19	23	38	72.0'	W=10.0%
										BOTTOM OF EXPLORATION AT 72' NOT REFUSAL

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-102

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-103
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/31/2002
DATE FINISH: 1/31/2002
ELEVATION: 138±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 9' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									.1'	ASPHALT PAVEMENT
	S-1	24"	12"	3.0'	6	6	4	4	1.0'	BROWN/BLACK SILTY SAND SOME GRAVEL TRACE ASH AND BRICK (FILL) ~MEDIUM DENSE~
	S-2	24"	16"	7.0'	19	31	35	34	9.0'	BROWN GRAVELLY SAND SOME SILT (FILL) ~VERY DENSE~
OPEN HOLE	S-3	18"	18"	11.5'	10	50	42		12.0'	BROWN SILTY SAND SOME GRAVEL (TILL) ~VERY DENSE~
	S-4	24"	24"	17.0'	16	23	29	30		GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) ~VERY DENSE~
	S-5	24"	24"	22.0'	8	38	15	15		
	S-6	24"	24"	27.0'	5	8	9	15		~MEDIUM DENSE~
	S-7	24"	24"	32.0'	15	16	20	25		~DENSE~
	S-8	24"	24"	34.0'	25	20	16	20	35.0'	
	S-9	24"	24"	37.0'	12	17	14	20	38.0'	GRAY SILT AND SAND TRACE GRAVEL WITH CLAYEY SILT SEAMS ~DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-103

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-103
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/31/2002
DATE FINISH: 1/31/2002
ELEVATION: 138±
SWC REP.: KBG

DRAFT

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 9' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	24"	42.0'	13	21	22	32		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~DENSE~
	S-11	24"	16"	47.0'	20	12	15	15		
	S-12	24"	24"	52.0'	11	15	17	26	55.5'	
	S-13	24"	18"	57.0'	25	20	20	23	58.0'	GRAY CLAYEY SILT TRACE SAND TRACE GRAVEL (TILL) ~ DENSE TO VERY DENSE ~
	S-14	24"	24"	62.0'	30	32	21	27	62.0'	GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~ VERY DENSE ~
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-103

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-104
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/31/2002
DATE FINISH: 1/31/2002
ELEVATION: 129±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									.3'	ASPHALT PAVEMENT
	S-1	24"	14"	3.0'	1	13	13	2	1.0'	BROWN GRAVELLY SAND SOME SILT (FILL)
	S-2	24"	16"	7.0'	10	15	7	6		BROWN SILTY SAND SOME GRAVEL (GLACIAL TILL FILL OR REWORKED NATIVE TILL) ~ MEDIUM DENSE ~
	S-3	24"	9"	12.0'	13	22	17	17		~ DENSE ~ W=9.9%
	S-4	24"	17"	17.0'	12	20	19	19	14.0'	~ DENSE ~ BROWN SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) W=9.7%
OPEN HOLE	S-5	24"	7"	22.0'	15	19	26	23		~ VERY DENSE ~
	S-6	24"	21"	24.0'	19	25	26	31		
	S-7	24"	24"	27.0'	14	27	27	23		
	S-8	24"	24"	32.0'	10	15	22	26	33.0'	~ DENSE ~
	S-9	24"	24"	37.0'	10	26	44	50/5"		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~VERY DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-104

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-104
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 1/31/2002
DATE FINISH: 1/31/2002
ELEVATION: 129±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	24"	42.0'	13	21	22	32		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~DENSE~
	S-11	24"	24"	47.0'	18	19	19	42	49.0'	
	S-12	24"	24"	52.0'	29	27	35	50/5"	52.0'	GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY WITH SAND SEAMS (TILL) ~VERY DENSE~
										BOTTOM OF EXPLORATION AT 52' NOT REFUSAL BOTTOM OF PIEZOMETER SET @ 25' 5' SCREEN

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-104

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-105
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/4/2002
DATE FINISH: 2/4/2002
ELEVATION: 138±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									.3'	ASPHALT PAVEMENT
	S-1	24"	10"	3.0'	9	11	39	24/3"		BROWN GRAVELLY SAND SOME SILT AND COBBLES (FILL)
	S-2	11"	6"	6.0'	22	50/5"				~DENSE~ W=7.3%
									9.0'	
OPEN HOLE	S-3	24"	24"	12.0'	12	23	31	29		BROWN SILTY SAND SOME GRAVEL (FILL)
									13.0'	~VERY DENSE~
	S-4	24"	0"	17.0'	20	20	26	29		GRAY SAND AND SILT TRACE TO SOME GRAVEL SOME CLAY (TILL) ~DENSE~
	S-5	24"	24"	22.0'	10	12	14	23		
	S-6	24"	24"	27.0'	16	28	14	19		
	S-7	24"	24"	32.0'	12	18	21	21		W=10.0%
	S-8	24"	24"	34.0'	34	29	28	27		
									35.0'	~VERY DENSE~
	S-9	24"	24"	37.0'	10	10	11	14		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY WITH OCCASIONAL SAND SEAMS AND CLAYEY SILT SEAMS
									39.0'	~MEDIUM DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-105

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-105
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/4/2002
DATE FINISH: 2/4/2002
ELEVATION: 138±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	0"	42.0'	20	28	40	41		GRAY SILTY SAND TRACE GRAVEL TRACE CLAY ~VERY DENSE~
	S-11	24"	24"	47.0'	10	10	16	29		W=10.5% ~MEDIUM DENSE~
	S-12	24"	6"	52.0'	13	21	26	31		~DENSE~
	S-13	24"	24"	57.0'	8	10	12	23		~MEDIUM DENSE~
	S-14	24"	24"	62.0'	12	9	13	18		
	S-15	24"	24"	72.0'	26	36	48	50/4"	72.0'	~VERY DENSE~
										BOTTOM OF EXPLORATION AT 72' NOT REFUSAL BOTTOM OF PIEOZMETER SET @ 35' 5' OF SCREEN 2 COMPOSITE SAMPLES COLLECTED FOR SHEAR ANALYSIS COMPOSITE A: S-5,6 AND 7; COMPOSITE B: S-8,9 AND 11

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-105

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-106
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/5/2002
DATE FINISH: 2/5/2002
ELEVATION: 137±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									.3'	ASPHALT PAVEMENT
	S-1	24"	10"	3.0'	7	3	4	8		BROWN GRAVELLY SAND, SOME SILT (FILL) ~ LOOSE BECOMMING...
	S-2	24"	10"	7.0'	11	20	31	34	8.5'	...VERY DENSE ~
OPEN HOLE	S-3	24"	24"	12.0'	15	21	30	46	13.0'	BROWN/GRAY SILTY SAND SOME GRAVEL (TILL) ~VERY DENSE~
	S-4	24"	9"	17.0'	13	27	34	34		GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) ~VERY DENSE~
	S-5	24"	24"	22.0'	13	16	21	27		~DENSE~
	S-6	24"	24"	27.0'	8	15	18	23		
	S-7	24"	24"	32.0'	10	13	22	30		
	S-8	24"	10"	34.0'	32	41	51	46		~VERY DENSE~
	S-9	24"	24"	37.0'	8	10	11	25		~MEDIUM DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-106

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-106
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/5/2002
DATE FINISH: 2/5/2002
ELEVATION: 137±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	2"	42.0'	14	18	21	29		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~DENSE~
	S-11	24"	21"	47.0'	10	9	8	21		~MEDIUM DENSE~
	S-12	24"	24"	52.0'	26	9	11	14	51.0'	GRAY SILTY CLAY TRACE SANDTRACE GRAVEL (TILL)
	S-13	24"	24"	57.0'	10	21	27	23	53.0'	w = 39.3' ~ VERY STIFF ~ q_p = 4-5 KSF GRAY SILT AND SAND SOME CLAY TRACE GRAVEL (TILL) ~DENSE~
	S-14	24"	24"	62.0'	18	35	22	27	62.0'	~VERY DENSE~
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-106

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-107
SHEET: 1 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/6/2002
DATE FINISH: 2/6/2002
ELEVATION: 130±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: WAYNE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24
CASING								
	S-1	24"	10"	3.0'	13	6	4	10
	S-2	24"	22"	7.0'	9	12	22	26
OPEN HOLE	S-3	24"	22"	12.0'	16	18	28	41
	S-4	24"	23"	17.0'	16	22	35	46
	S-5	24"	24"	22.0'	9	14	17	20
	S-6	24"	24"	27.0'	15	21	28	29
	S-7	24"	24"	29.0'	31	19	18	27
	S-8	24"	24"	32.0'	20	16	26	31
	S-9	24"	17"	37.0'	18	39	42	35

DEPTH	STRATA & TEST DATA
.1'	ASPHALT PAVEMENT
1.0'	BROWN GRAVELLY SAND SOME SILT (FILL)
	~LOOSE~
5.2'	BROWN /BLACK SILTY SAND SOME GRAVEL TRACE BRICK (FILL)
	GRAY SAND AND SILT TRACE TO SOME GRAVEL TRACE CLAY (TILL)
	~DENSE~
	W=10.1%
	~ VERY DENSE ~
	~DENSE~
	W=9.7%
	~VERY DENSE~
40.0'	

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-107

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-107
SHEET: 2 OF 2
PROJECT NO.: 01-0304.1
DATE START: 2/6/2002
DATE FINISH: 2/6/2002
ELEVATION: 130±
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: WAYNE

DRAFT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 lbs	30"
CORE BARREL:				

WATER LEVEL INFORMATION
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-10	24"	24"	42.0'	29	27	29	20	43.0'	GRAY SILTY CLAY TRACE SAND TRACE GRAVEL (TILL) ~VERY STIFF~ q_p = 4 KSF W=30.9%
	S-11	24"	24"	47.0'	12	14	15	25		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~MEDIUM DENSE~
	S-12	24"	24"	52.0'	19	30	27	29		~VERY DENSE~
	S-13	24"	24"	57.0'	18	36	35	42		
	S-14	24"	16"	62.0'	25	30	40	76	62.0'	BOTTOM OF EXPLORATION AT 62' NOT REFUSAL BOTTOM OF PIEZOMETER SET @ 35' 5' SCREEN

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-107

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

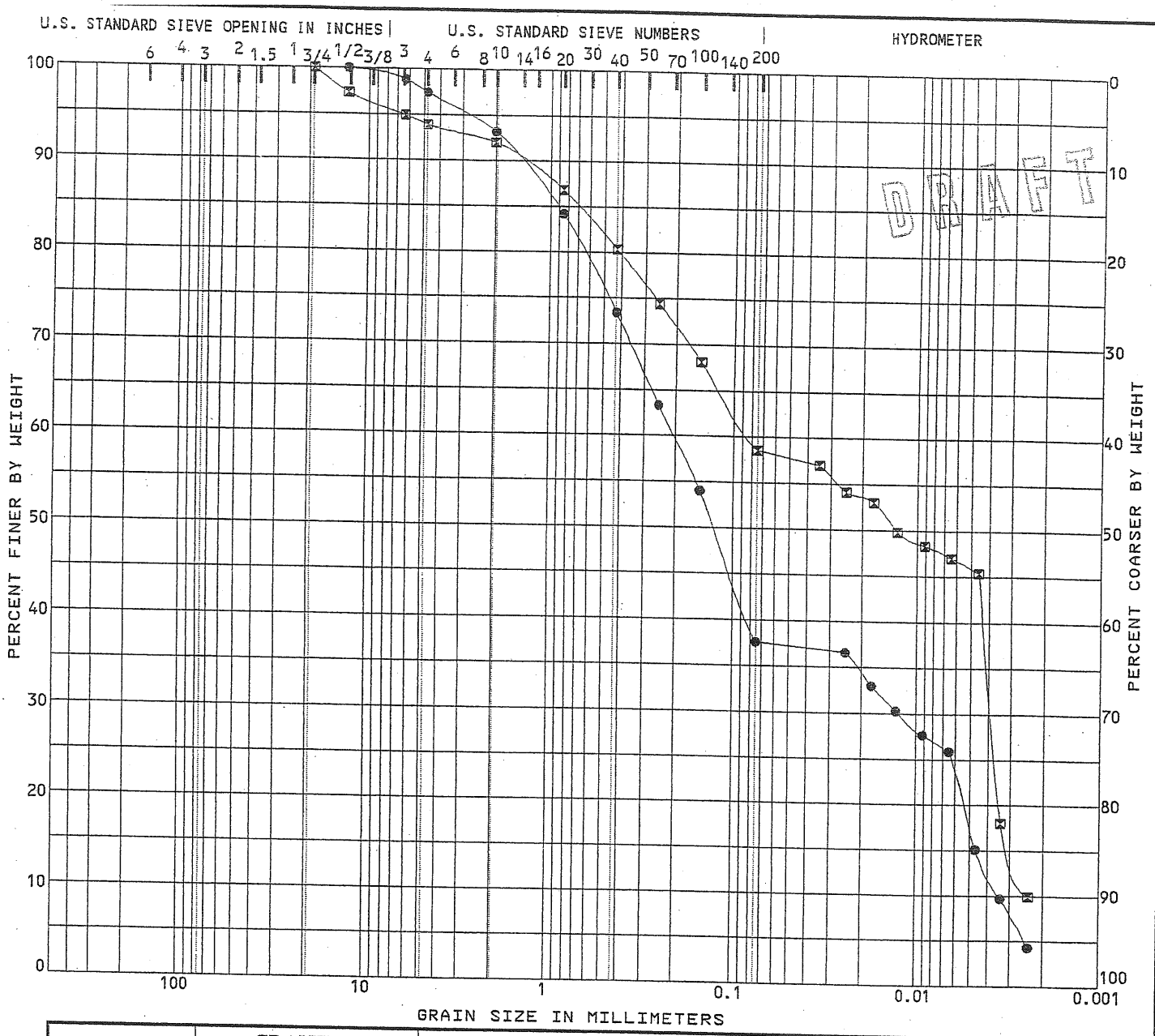
Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.



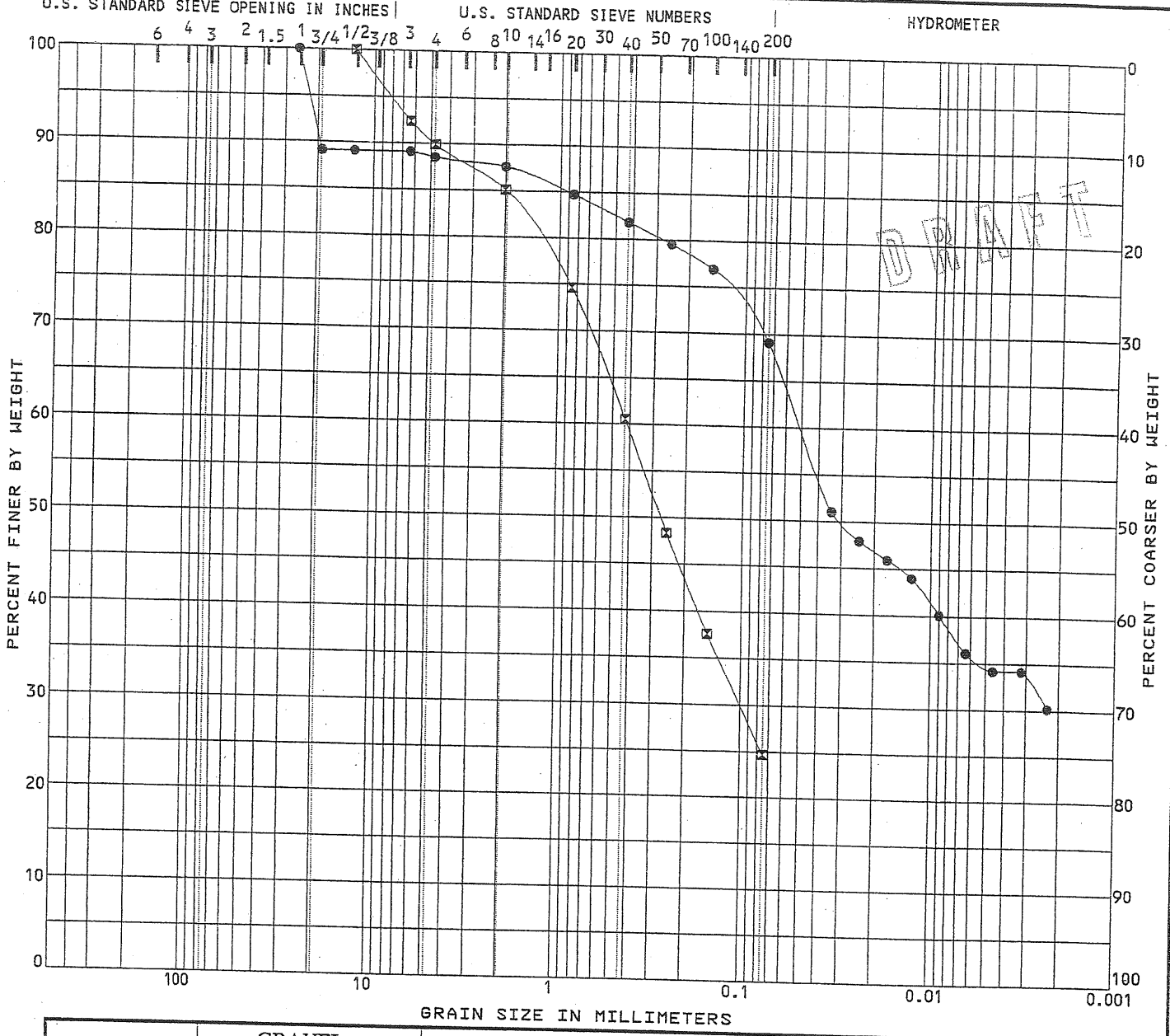
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-102 S-7 30-32	SILT and SAND with trace gravel, trace clay	12.0					
⊠	B-102, S-10 45-47'	SILT and SAND with some gravel, some clay	22.3					

	Specimen Identification	D100	D60	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	B-102 S-7 30-32	12.70	0.21	0.012	0.0035	2.6	59.8	37.6	
⊠	B-102, S-10 45-47'	19.00	0.08	0.004	0.0024	6.1	35.4	58.5	

S.W.COLE ENGINEERING, INC.

Project Me.Med.Ctr./Women's & Infants Add.	Location Portland, Maine
SWC Job No. 01-0304.1	Sheet No. 17
Date March 12, 2002	GRADATION CURVES



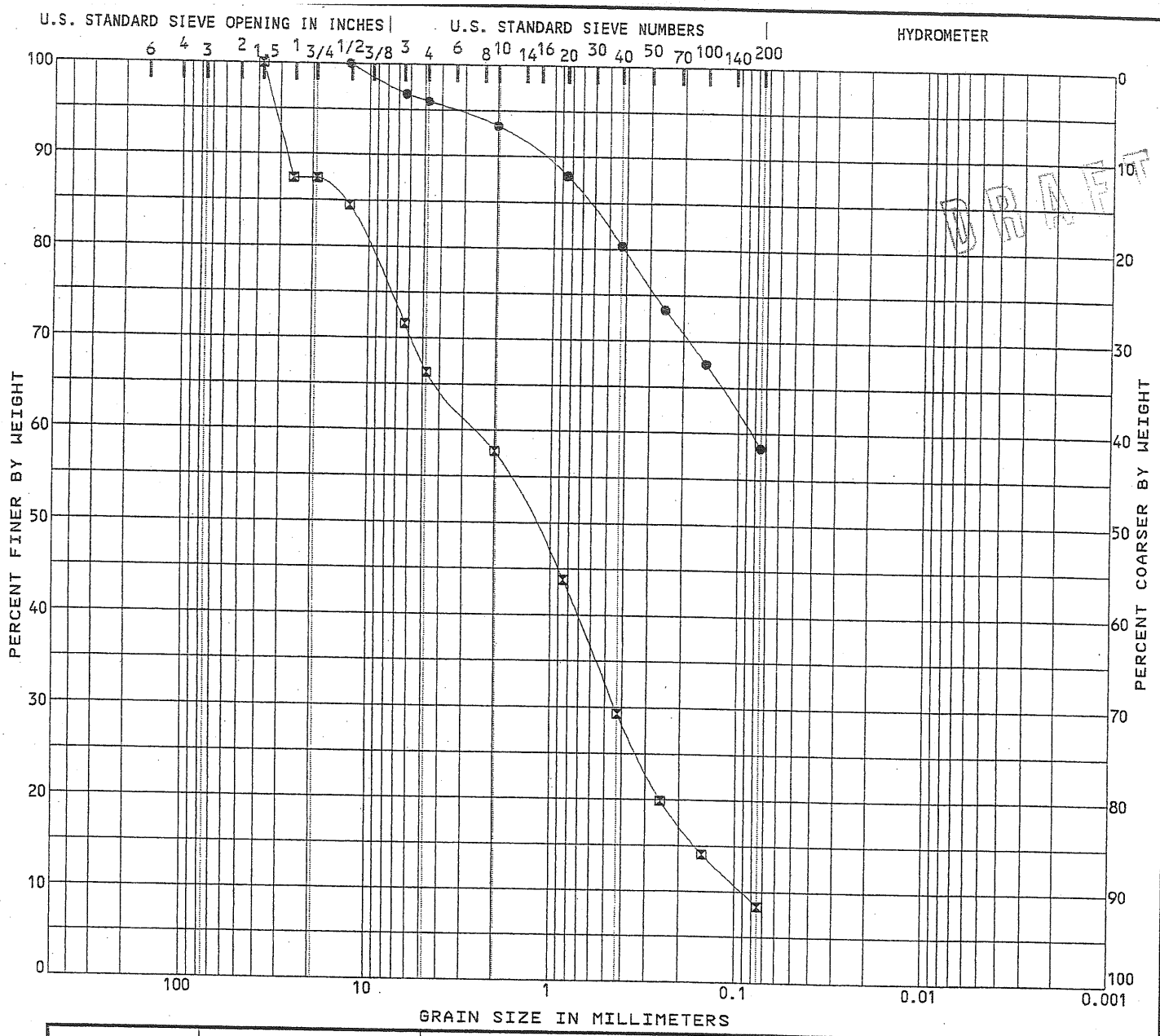
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-102, S-14 60-62'	Clayey sandy SILT with some gravel	23.8					
⊠ B-104, S-3 10-12'	Silty SAND with some gravel	9.9					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-102, S-14 60-62'	25.40	0.05			11.5	19.4	69.1	
⊠ B-104, S-3 10-12'	12.70	0.42	0.100		10.1	65.2	24.7	

S.W.COLE ENGINEERING, INC.

Project	Me.Med.Ctr./Women's & Infants Add.	Location	Portland, Maine
SWC Job No.	01-0304.1	Sheet No.	18
Date	March 12, 2002	GRADATION CURVES	



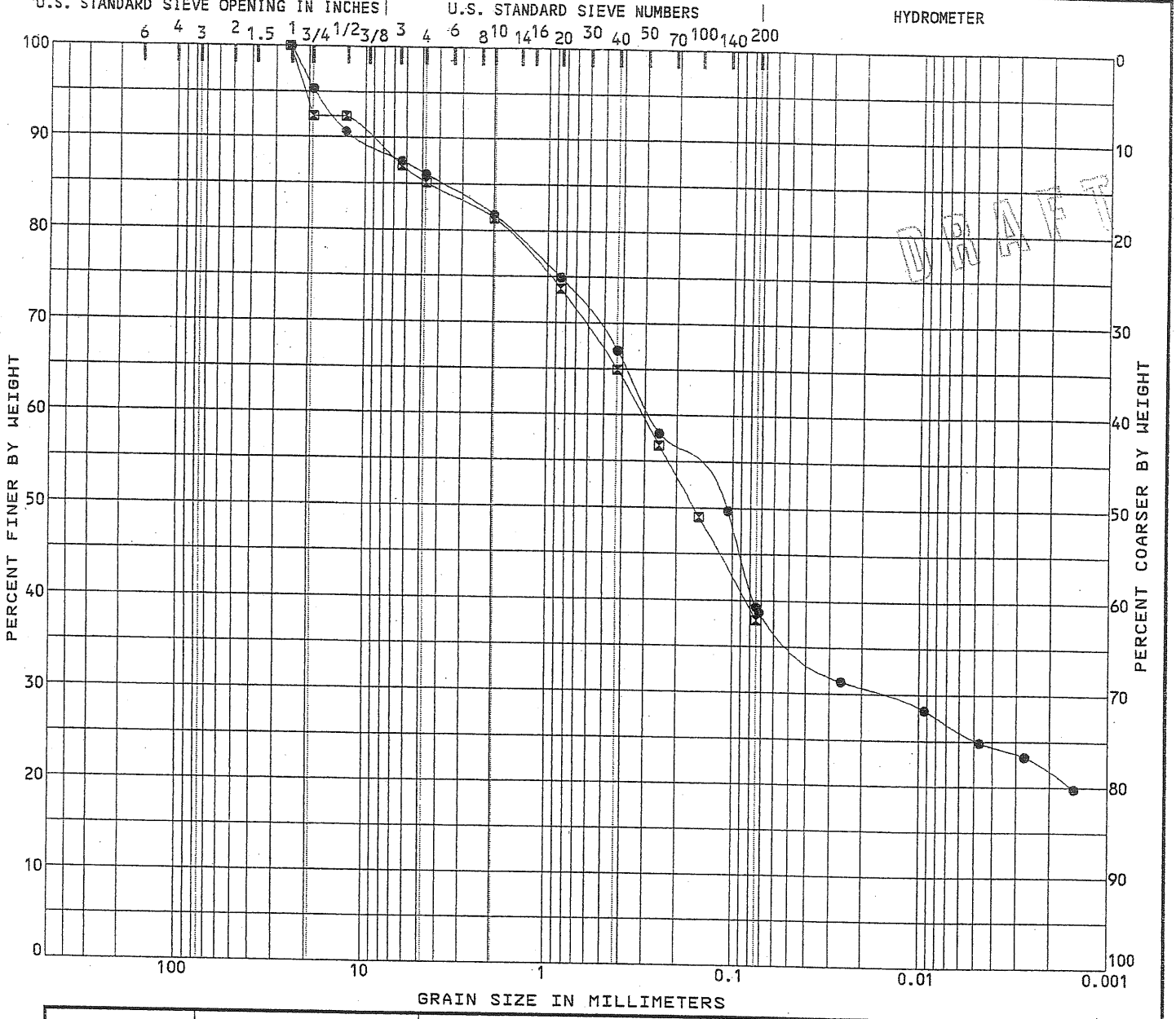
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-104, S-5 20-22'	SILT and SAND with trace gravel, trace clay	9.7					
⊠ B-105, S-1 1-3'	Gravelly SAND with some silt	7.3				0.84	27.7

Specimen Identification	D100	D60	D50	D10	%Gravel	%Sand	%Silt	%Clay
● B-104, S-5 20-22'	12.70	0.08			4.1	37.5	58.4	
⊠ B-105, S-1 1-3'	37.50	2.52	0.440	0.0911	33.7	57.9	8.4	

S.W.COLE ENGINEERING, INC.

Project	Me.Med.Ctr./Women's & Infants Add.	Location	Portland, Maine
SWC Job No.	01-0304.1	Sheet No.	19
Date	March 12, 2002	**GRADATION CURVES**	



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

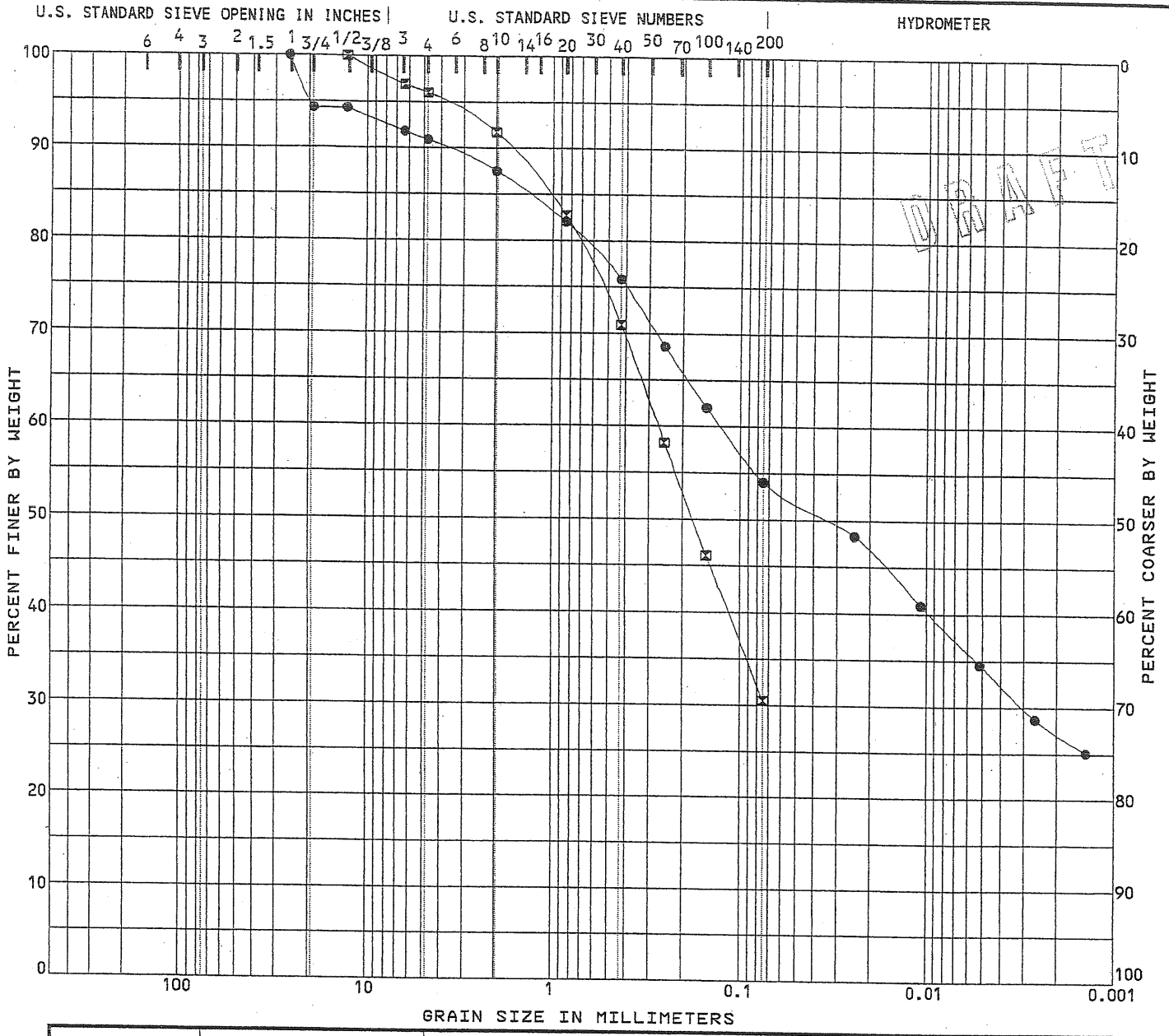
Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-105, S-5,6 & 7	SAND and SILT with some gravel, some clay	10.6	18	13	5		
⊠ B-105, S-7 30-32'	SAND and SILT with some gravel, trace clay	10.0					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-105, S-5,6 & 7	25.00	0.28	0.017		14.0	46.7	17.8	21.5
⊠ B-105, S-7 30-32'	25.40	0.31			14.9	47.2	37.9	

S.W.COLE
ENGINEERING, INC.

Project Me.Med.Ctr./Women's & Infants Add.
Location Portland, Maine
SWC Job No. 01-0304.1
Sheet No. 20
Date March 14, 2002

GRADATION CURVES



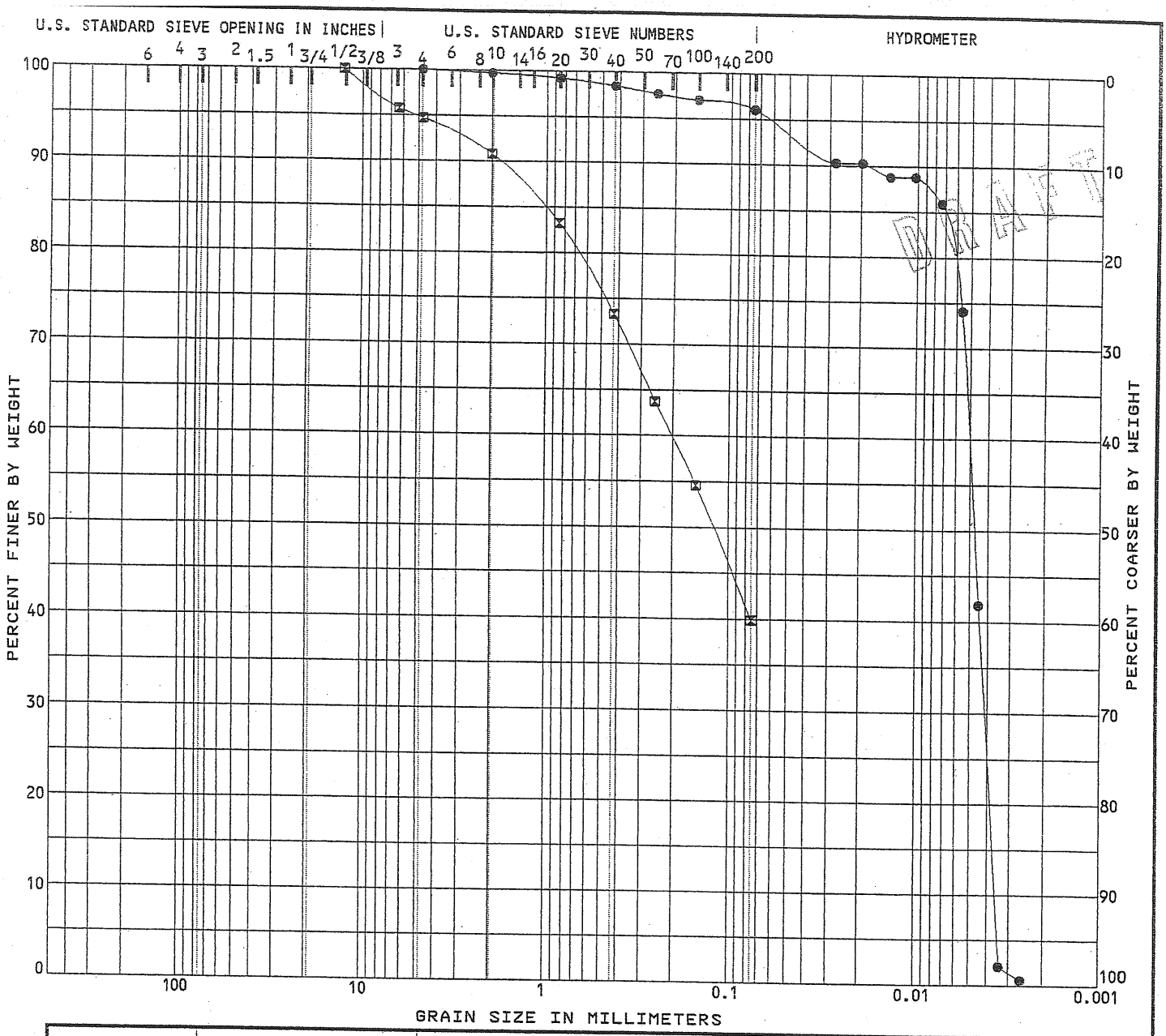
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	WC %	LL	PL	PI	Cc	Cu
●	B-105, S-8,9 & 11	SAND and SILT with some gravel, some clay	9.2	21	12	9		
☒	B-105, S-11 45-47'	Silty SAND with trace gravel, trace clay	10.5					

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-105, S-8,9 & 11	25.40	0.13	0.003		9.1	36.9	26.8	27.2
☒	B-105, S-11 45-47'	12.70	0.27			4.0	65.5	30.5	

S.W.COLE ENGINEERING, INC.

Project Me.Med.Ctr./Women's & Infants Add.	Location Portland, Maine
SWC Job No. 01-0304.1	Sheet No. 21
Date March 14, 2002	GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

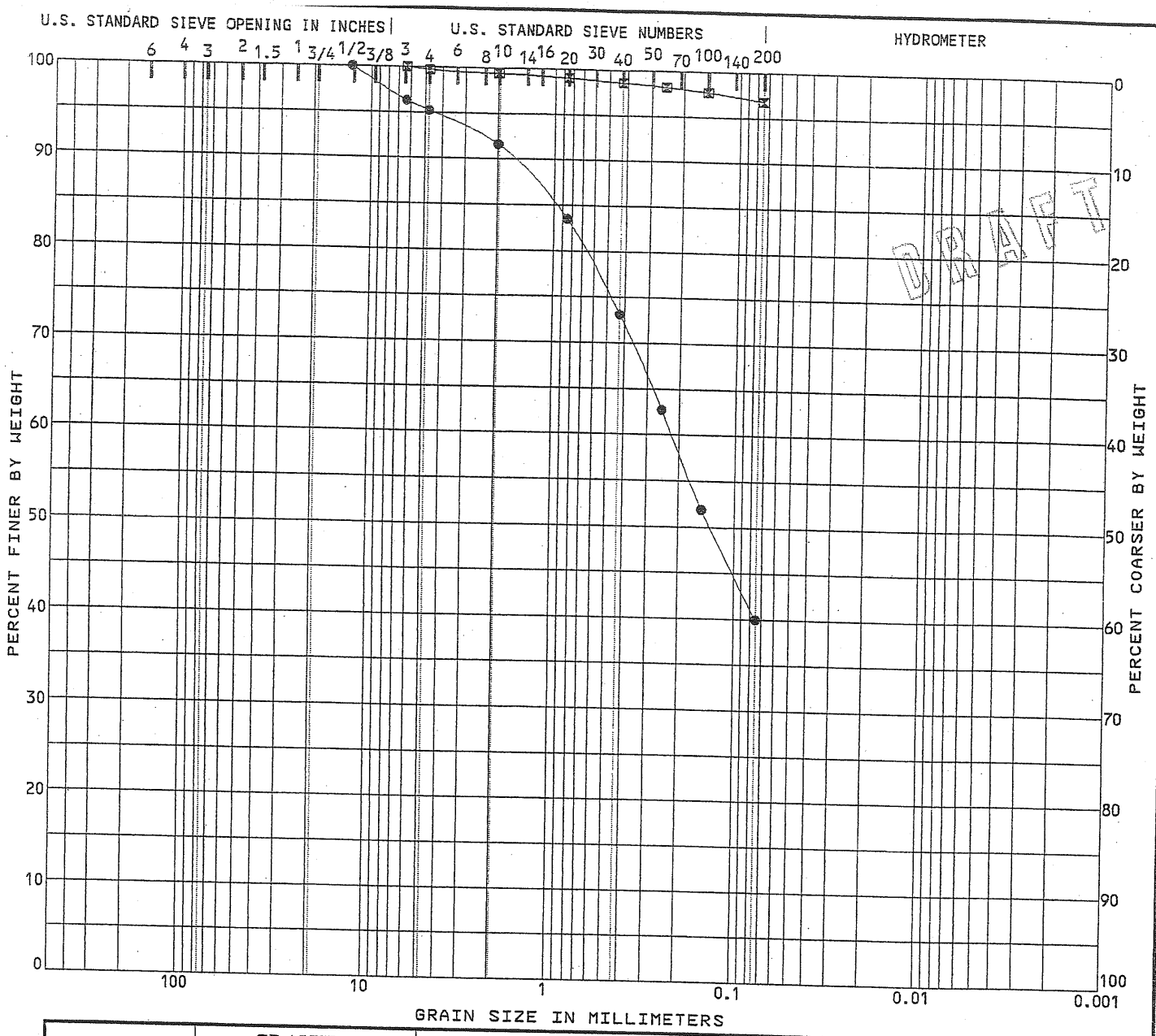
	Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
●	B-106, S-12 50-52'	Silty CLAY with trace sand	39.3					
☒	B-107, S-3 10-12'	SAND and SILT with some gravel, trace clay	10.1					

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-106, S-12 50-52'	4.75	0.01	0.004	0.0036	0.0	4.0	96.0	
☒	B-107, S-3 10-12'	12.70	0.20			5.3	54.8	39.9	

S.W.COLE ENGINEERING, INC.

Project Me.Med.Ctr./Women's & Infants Add.
Location Portland, Maine
SWC Job No. 01-0304.1
Sheet No. 22
Date March 14, 2002

GRADATION CURVES



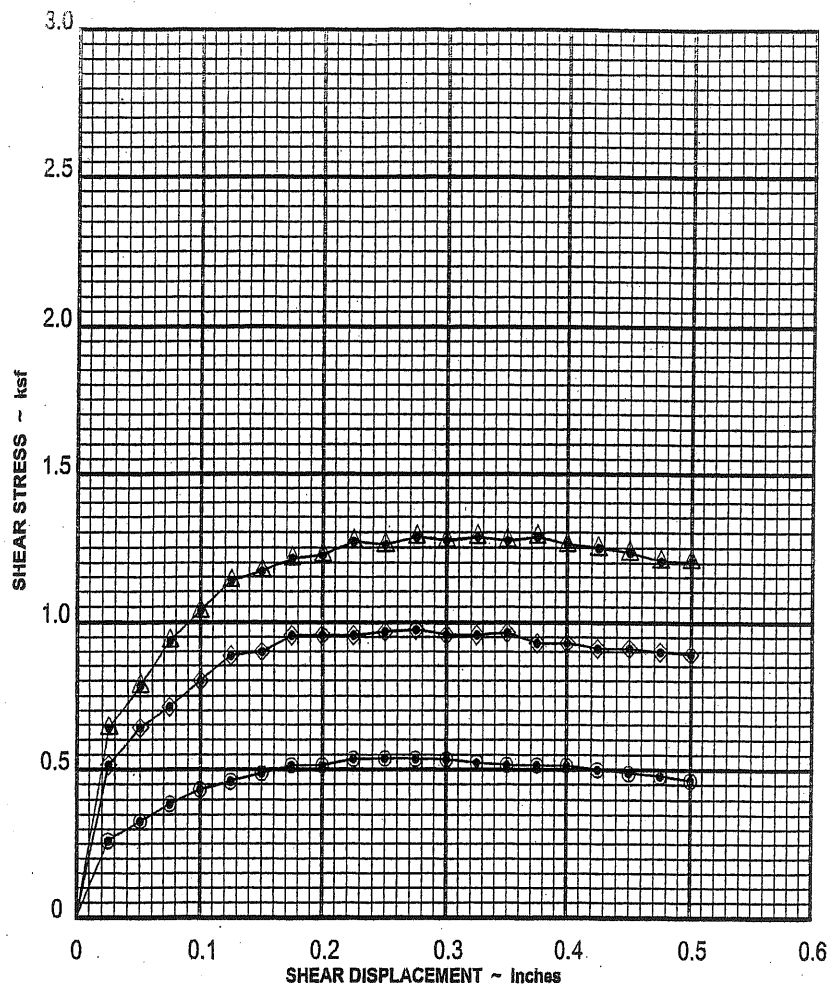
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

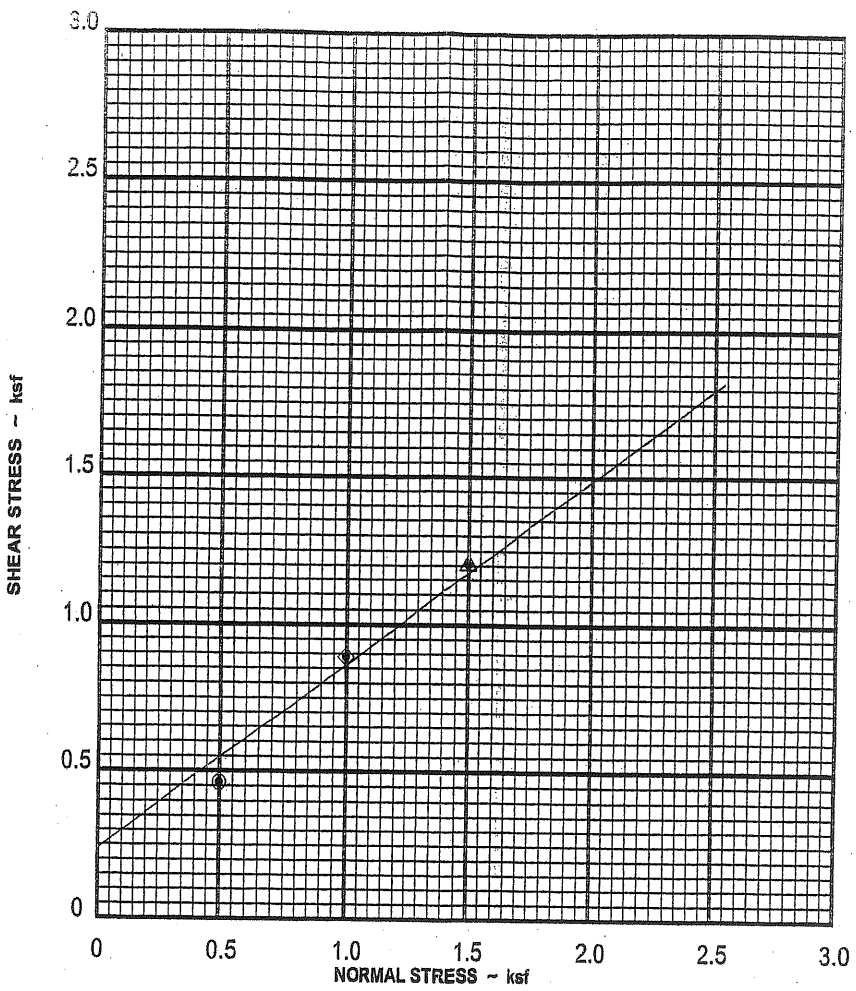
Specimen Identification		Classification	WC%	LL	PL	PI	Cc	Cu
●	B-107, S-6 25-27'	SAND and SILT with trace gravel, trace clay	9.7					
☒	B-107, S-10 40-42'	Silty CLAY with trace sand, trace gravel	30.9					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-107, S-6 25-27'	12.70	0.22			4.8	55.2	40.0	
☒	B-107, S-10 40-42'	6.35				0.3	2.9	96.8	

S.W.COLE ENGINEERING, INC.

Project Me.Med.Ctr./Women's & Infants Add.	Location Portland, Maine
SWC Job No. 01-0304.1	Sheet No. 23
Date March 12, 2002	GRADATION CURVES





SAMPLE 105B = COMBINED SAMPLES FROM BORING B-105 (S-8, S-9 AND S-11).

PLOT	RUN NO.	SOURCE	SWC SAMPLE NO.	CONFINING PRESSURE (ksf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)
◉	1	B-105	S-105B	0.5	14.2	112.3
◈	2	B-105	S-105B	1.0	14.2	112.3
◬	3	B-105	S-105B	1.5	14.2	112.3

RESIDUAL ∠ = 32.0°

COHESIVE INTERCEPT = 0.24 ksf

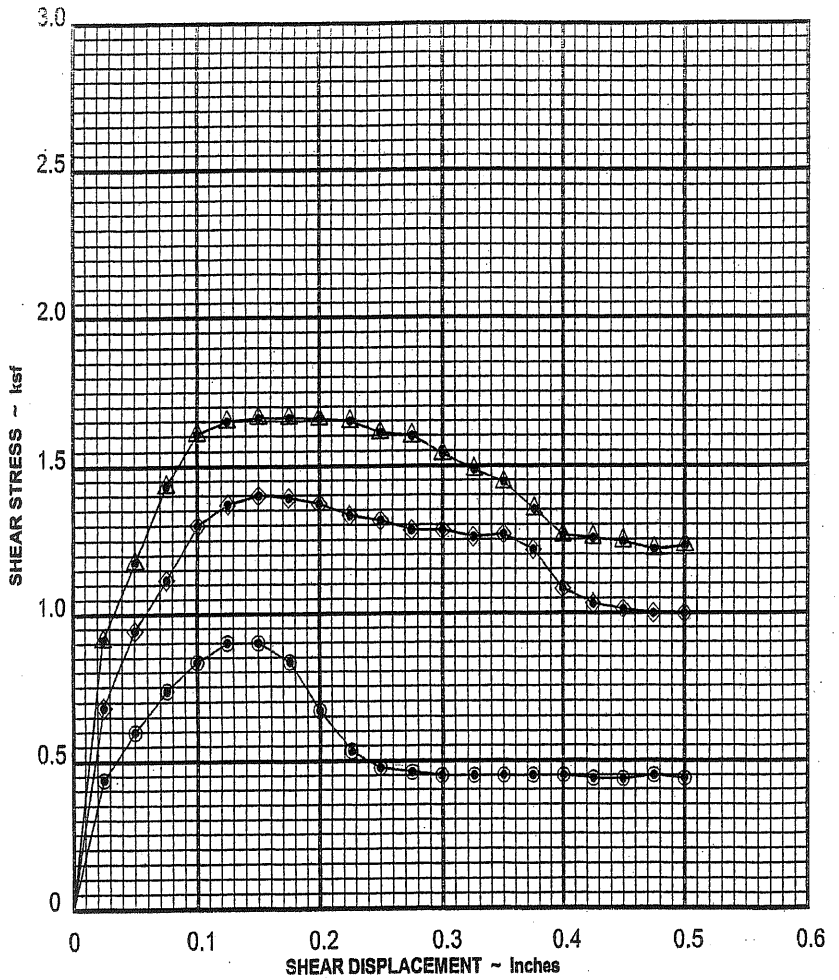
S.W.COLE ENGINEERING, INC.

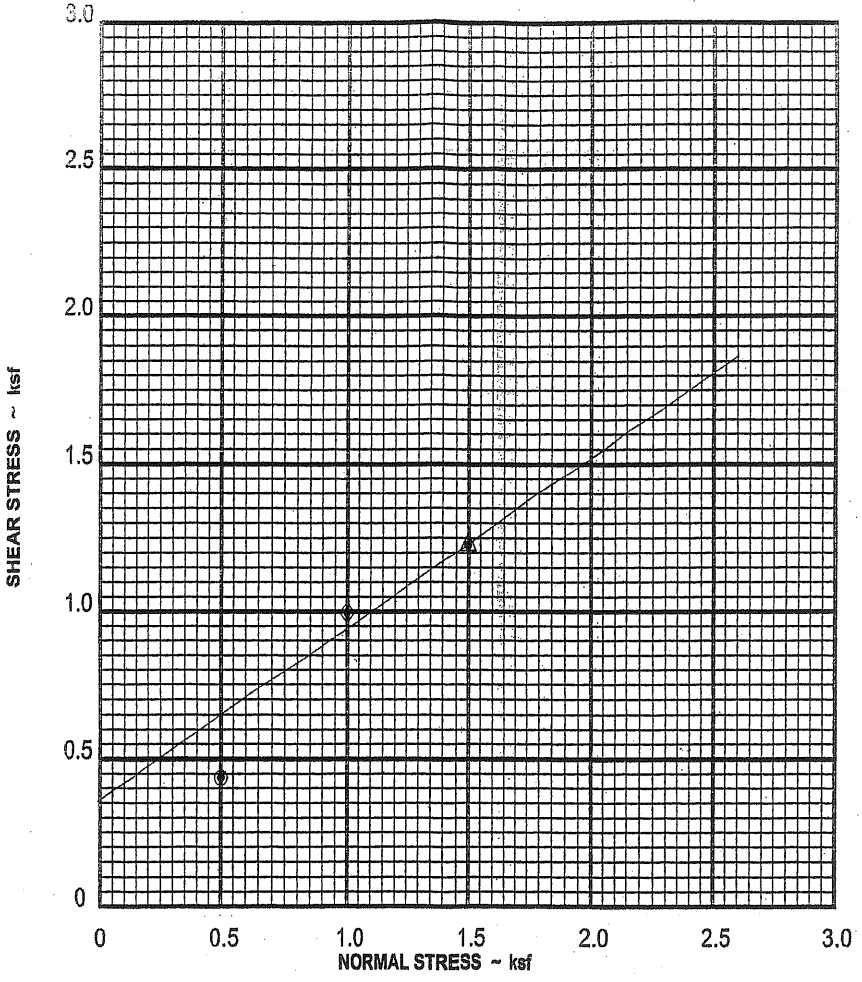
MAINE MEDICAL CENTER

DIRECT SHEAR ASTM D-3080

Proposed Building Addition
Women and Infants M.O.B.
and Parking Garage
Charles Street Portland, Maine

Job No.	01-0304.1 S	Scale	As Shown
Date :	03/29/02	Sheet	25





SAMPLE 105A = COMBINED SAMPLES FROM BORING B-105 (S-5, S-6 AND S-7).

PLOT	RUN NO.	SOURCE	SWC SAMPLE NO.	CONFINING PRESSURE (ksf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)
◉	1	B-105	S-105A	0.5	10.3	122.4
◈	2	B-105	S-105A	1.0	10.3	122.4
◬	3	B-105	S-105A	1.5	10.3	122.4

RESIDUAL ∠ = 30.1°

COHESIVE INTERCEPT = 0.36 ksf

S.W.COLE ENGINEERING, INC.

MAINE MEDICAL CENTER

DIRECT SHEAR ASTM D-3080

Proposed Building Addition
Women and Infants M.O.B.
and Parking Garage
Charles Street Portland, Maine

Job No.	01-0304.1 S	Scale	As Shown
Date:	03/29/02	Sheet	24

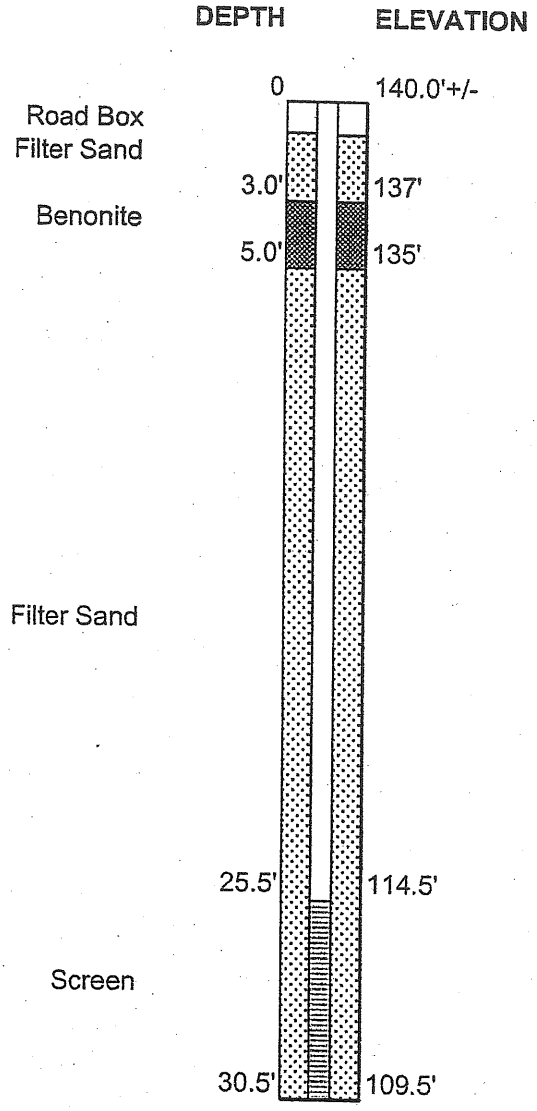
MAINE MEDICAL CENTER 01-0304.1

PIEZOMETER READINGS

BORING # B-2

DRAFT

DATE	DEPTH	ELEVATION
6/13/2001	9.95'	130.05'
1/24/2002	10.20'	129.80'
2/25/2002	9.80'	130.20'
3/1/2002	9.75'	130.25'



Piezometer Installed: 5/17/2001

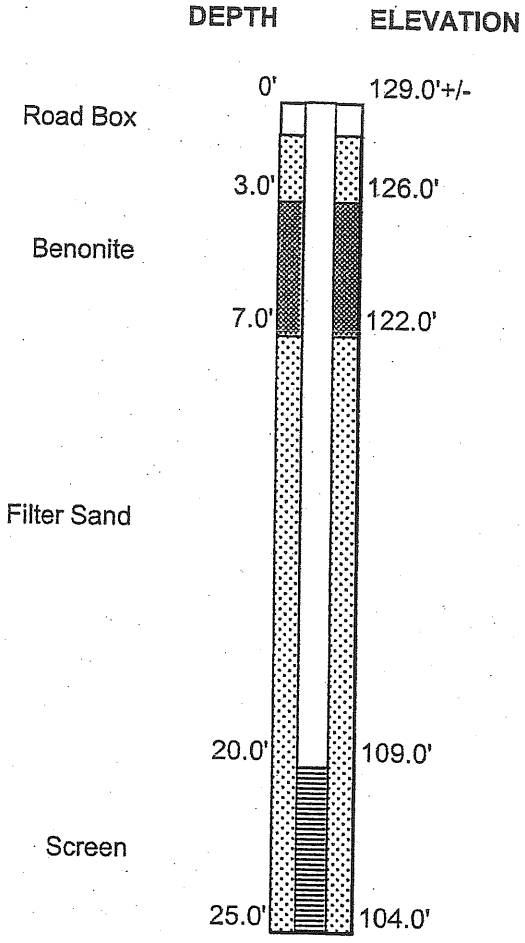
MAINE MEDICAL CENTER 01-0304.1

PIEZOMETER READINGS

BORING # B-104

DRAFT

DATE	DEPTH	ELEVATION
2/11/2002	2.90'	126.10'
2/25/2002	3.35'	125.65'
3/1/2002	3.40'	125.60'



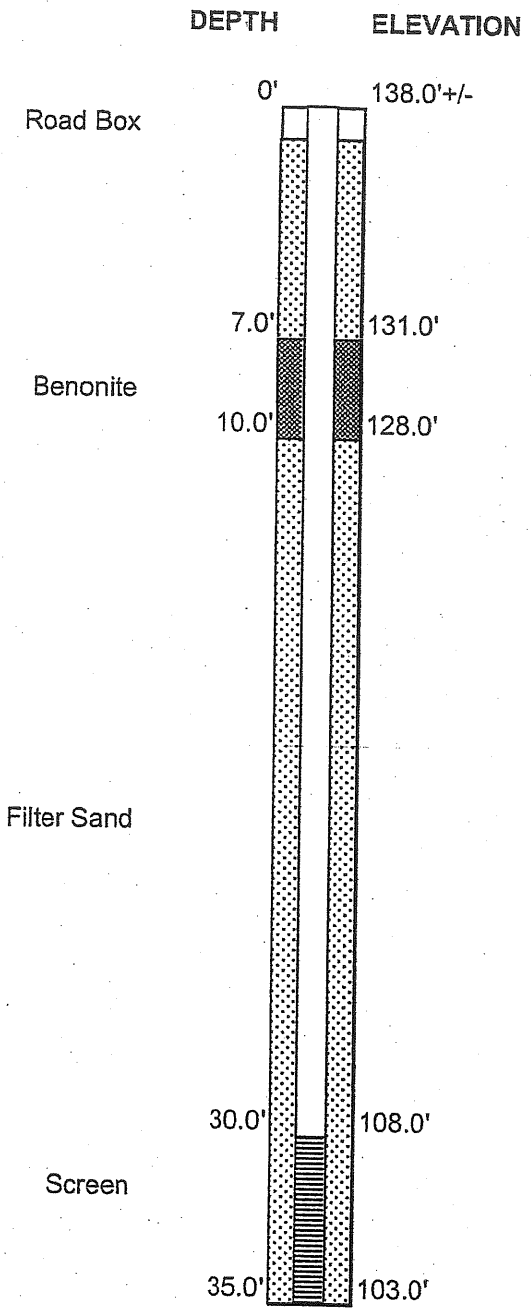
Piezometer Installed: 1/31/02

MAINE MEDICAL CENTER 01-0304.1

PIEZOMETER READINGS

BORING # B-105

DATE	DEPTH	ELEVATION
2/11/2002	10.10'	127.90'
2/25/2002	9.90'	128.10'
3/1/2002	9.95'	128.05'



Piezometer Installed: 2/4/02

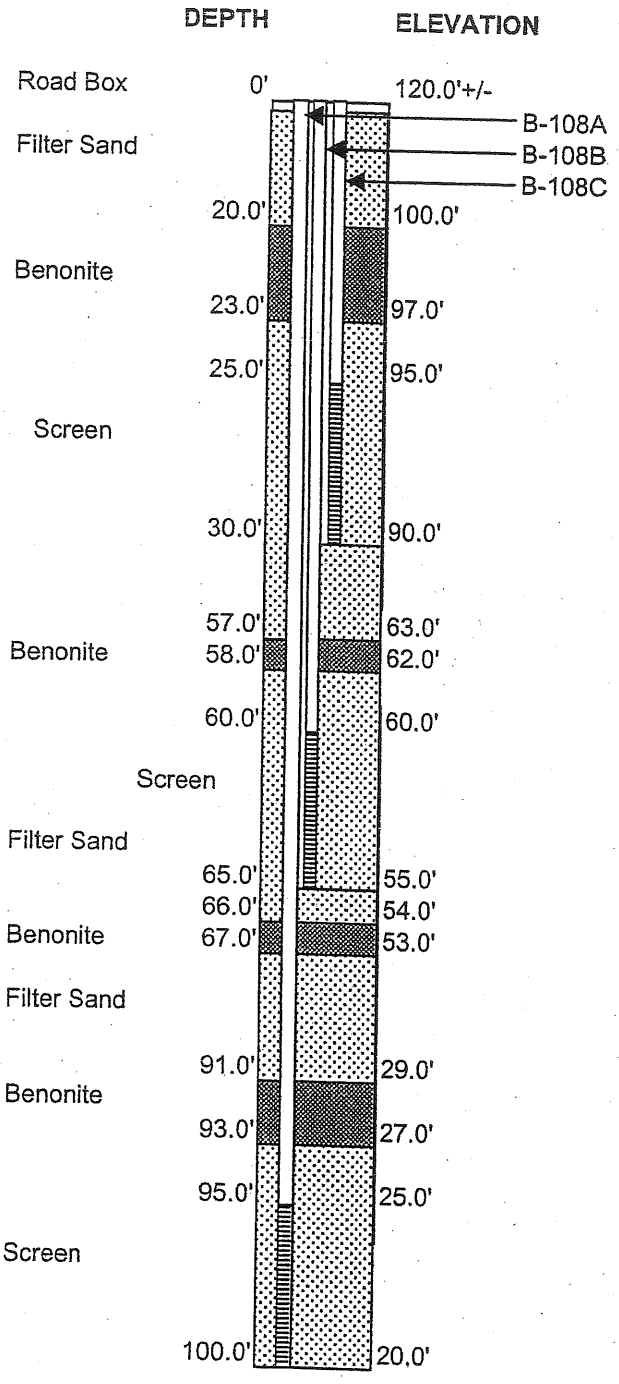
MAINE MEDICAL CENTER 02-0067

PIEZOMETER READINGS

BORING # B-108 A

DRAFT

DATE	DEPTH	ELEVATION
2/12/2002	20.50'	99.50'
2/25/2002	94.90'	25.10'
3/1/2002	94.90'	25.10'



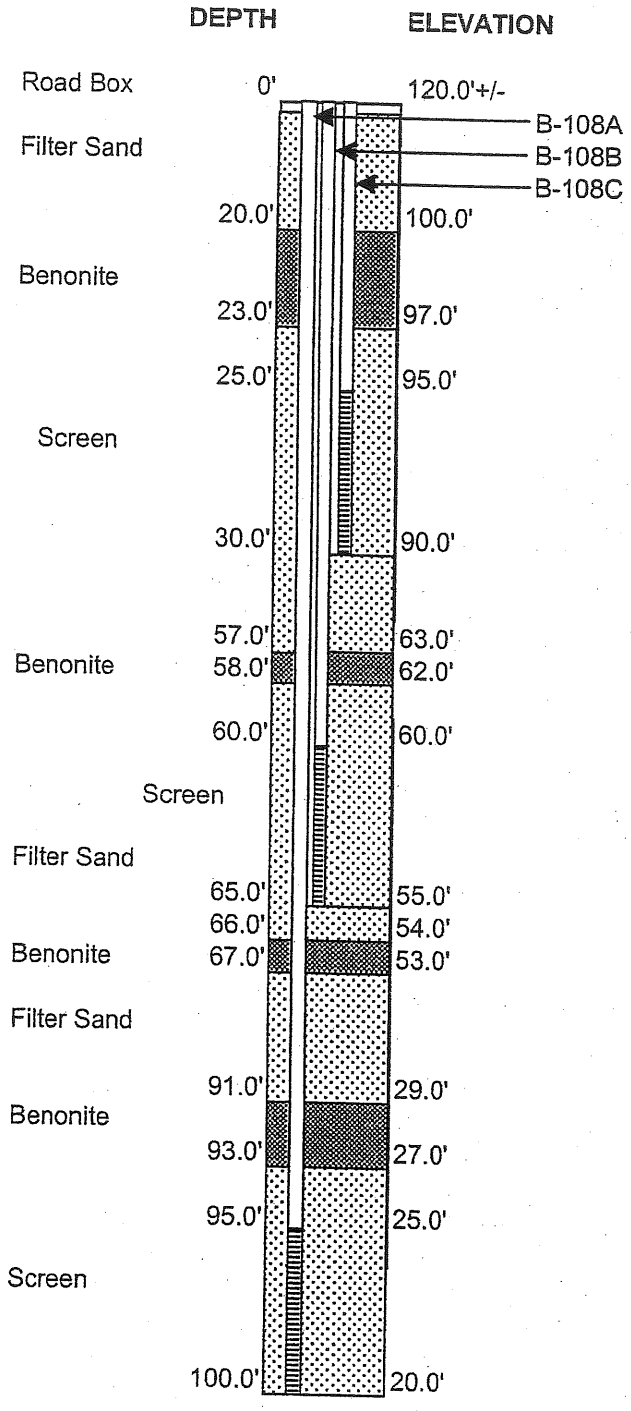
Piezometer Installed: 2/11/02

MAINE MEDICAL CENTER 02-0067

PIEZOMETER READINGS

BORING # B-108 B

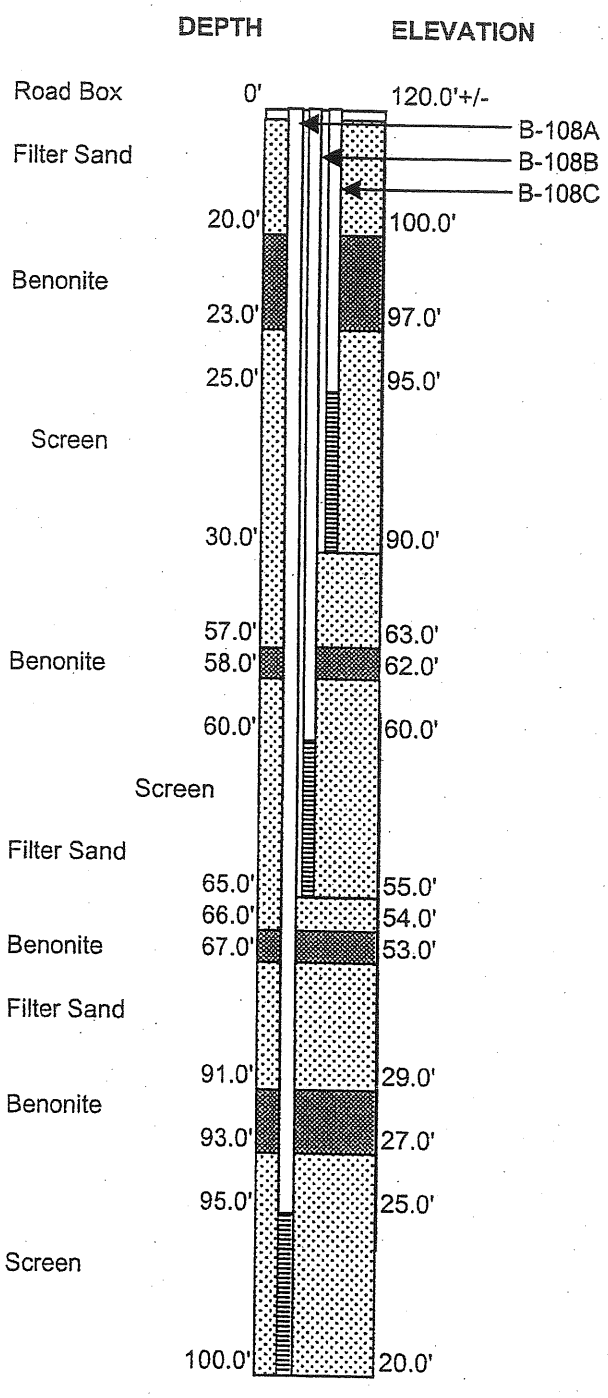
DATE	DEPTH	ELEVATION
2/12/2002	27.50'	92.50'
2/25/2002	40.20'	79.80'
3/1/2002	42.45'	77.55'



Piezometer Installed: 2/11/02

MAINE MEDICAL CENTER 02-0067
PIEZOMETER READINGS
BORING # B-108 C

DATE	DEPTH	ELEVATION
2/12/2002	12.30'	107.70'
2/25/2002	21.65'	98.35'
3/1/2002	21.40'	98.60'



Piezometer Installed: 2/11/02

APPENDIX A

1965 EXPLORATIONS (#1 THROUGH #11) FOR EXISTING HOSPITAL STRUCTURES (made by others)

APPENDIX B

2001 EXPLORATIONS (B-1 THROUGH B-5) MADE FOR PRELIMINARY INVESTIGATION OF THE WOMEN AND INFANTS M.O.B. AND PARKING STRUCTURE

(BY S. W. COLE ENGINEERING, INC—#01-0304)

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-1
SHEET: 1 OF 1
PROJECT NO.: 01-0304 S
DATE START: 5/17/2001
DATE FINISH: 5/17/2001
ELEVATION: 138.0'+/-
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									.2'	ASPHALT PAVEMENT
	S-1	24"	8"	2.0'	6	7	9	6		~MEDIUM DENSE~
									3.0'	BROWN GRAVELLY SAND, SOME SILT, BRICK FRAGMENTS (FILL)
										~MEDIUM DENSE TO DENSE~
										BROWN GRAVELLY SAND W/TRACE GRAVEL (FILL)
	S-2	24"	16"	7.0'	10	16	21	36		
									10.0'	
										~VERY DENSE~
	S-3	24'	1"	12.0'	39	35	36	41		GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
	S-4	24"	20"	17.0'	18	37	22	19		w=9.2%
	S-5	24"	23"	22.0'	8	7	11	12		~MEDIUM DENSE~ w=9.6%
	S-6	24"	3"	27.0'	14	15	19	22		~DENSE~ w=10.4%
	S-7	24"	20"	32.0'	16	12	15	25		w=8.9%
	S-8	24"	24"	37.0'	12	9	17	19		w=9.6%
	S-9	24"	24"	39.0'	8	19	36	30	39.0'	
										BOTTOM OF EXPLORATION AT 39.0' (NO REFUSAL)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-1

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-2
SHEET: 1 OF 1
PROJECT NO.: 01-0304 S
DATE START: 5/17/2001
DATE FINISH: 5/17/2001
ELEVATION: 140.0'+/-
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST BELOW 15.0'

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									.3'	TOPSOIL AND ORGANICS
	S-1	24"	18"	2.0'	4	5	3	3		~LOOSE~ BROWN SAND W/SOME GRAVEL, TRACE SILT (FILL)
									4.5'	
	S-2	24"	21"	7.0'	36	25	23	31		~DENSE~ BROWN GRAVELLY SAND W/SOME SILT (FILL)
									10.5'	
	S-3	24'	24"	12.0'	29	27	26	52		~VERY DENSE~ GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
	S-4	24"	24"	17.0'	5	8	15	23		~MEDIUM DENSE~
	S-5	24"	20"	22.0'	23	21	28	29		~VERY DENSE~
	S-6	24"	22"	27.0'	10	17	25	28		~DENSE~
	S-7	6"	0	30.5'	23	50/0			30.5'	BOTTOM OF EXPLORATION AT 30.5' REFUSAL (PROBABLE BEDROCK)

NOTE :
PIEZOMETER SET AT 30.5' WITH 5' SCREEN.
WATER DEPTH MEASURED TO BE 10' ON 6/13/01

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-2

S.W.COLE ENGINEERING, INC.

BORING LOG

DRAFT

BORING NO.: B-3
SHEET: 1 OF 1
PROJECT NO.: 01-0304 S
DATE START: 5/18/2001
DATE FINISH: 5/18/2001
ELEVATION: 135.0'+/-
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST BELOW 24.0'

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									.2'	ASPHALT PAVEMENT
	S-1	24"	8"	2.0'	14	10	11	8		~MEDIUM DENSE~
										DARK BROWN GRAVELLY SILTY SAND W/BRICK FRAGMENTS (FILL)
									5.0'	
									6.5'	BROWN SAND W/TRACE SILT (FILL) ~DENSE~
	S-2	24"	18"	7.0'	15	27	40	32		GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
										~DENSE TO VERY DENSE~
	S-3	24'	24"	12.0'	12	22	37	36		
		24"	0	17.0'	21	48	37	44		
		24"	0	22.0'	8	7	11	12		~MEDIUM DENSE~
	S-4	24"	15"	27.0'	8	13	17	23		
	S-5	24"	9"	29.0'	22	33	34	41		~VERY DENSE~
	S-6	24"	1"	32.0'	19	41	38	37		
	S-7	24"	24"	37.0'	9	16	19	25		
	S-8	24"	24"	39.0'	19	28	27	42	39.0'	
										BOTTOM OF EXPLORATION AT 39.0' (NO REFUSAL)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-3

S.W.COLE ENGINEERING, INC.

BORING LOG

DRAFT

BORING NO.: B-4
SHEET: 1 OF 1
PROJECT NO.: 01-0304 S
DATE START: 5/17/2001
DATE FINISH: 5/17/2001
ELEVATION: 129.5'+/-
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									.2'	ASPHALT PAVEMENT
	S-1	24"	12"	2.0'	5	5	2	5	1.0'	BROWN GRAVELLY SAND W/TRACE SILT (FILL)
	S-2	18"	18'	5.5'	53	32	56			GRAY SAND AND SILT W/TRACE GRAVEL (TILL) ~VERY DENSE~
	S-3	18"	16"	10.5'	26	24	58			
	S-4	24"	17"	16.0'	6	16	20	26		~DENSE~
	S-5	24"	24'	21.0'	4	18	19	23		
									24.0'	BOTTOM OF EXPLORATION AT 24.0' REFUSAL (PROBABLE BEDROCK)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-4

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-5
SHEET: 1 OF 1
PROJECT NO.: 01-0304 S
DATE START: 5/18/2001
DATE FINISH: 5/18/2001
ELEVATION: 125.5'+/-
SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER
LOCATION: CHARLES STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4 1/4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST BELOW 14.0'
SOILS SATURATED BELOW 24.5'

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									.5'	ASPHALT PAVEMENT
	S-1	24"	10"	2.0'	9	13	19	20	3.5'	~DENSE~ BROWN SAND AND GRAVEL W/SOME SILT (FILL) w=9.2%
	S-2	14"	11"	7.0'	21	36	50/2"		8.0'	~VERY DENSE~ BROWNISH GRAY GRAVELLY SANDY SILT (FILL) w=7.0%
	S-3	24'	18"	12.0'	15	32	37	38		~VERY DENSE~ BROWNISH GRAY SAND AND SILT W/SOME GRAVEL (TILL) w=9.3%
	S-4	24"	21"	17.0'	10	17	13	12		w=13.8% ~MEDIUM SENSE~
	S-5	24"	24"	22.0'	6	18	17	16	24.5'	w=13.8%
	S-6	24"	6"	27.0'	2	8	9	5	28.0'	BROWNISH GRAY SANDY CLAY W/SOME GRAVEL w=34.1% ~MEDIUM DENSE/STIFF~
		24"	0	32.0'	12	21	29	21		GRAY SAND AND SILT W/TRACE GRAVEL (TILL) ~DENSE~
	S-7	24"	24"	37.0'	11	14	14	29	37.0'	w=14.0%
										BOTTOM OF EXPLORATION AT 37.0' (NO REFUSAL)

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

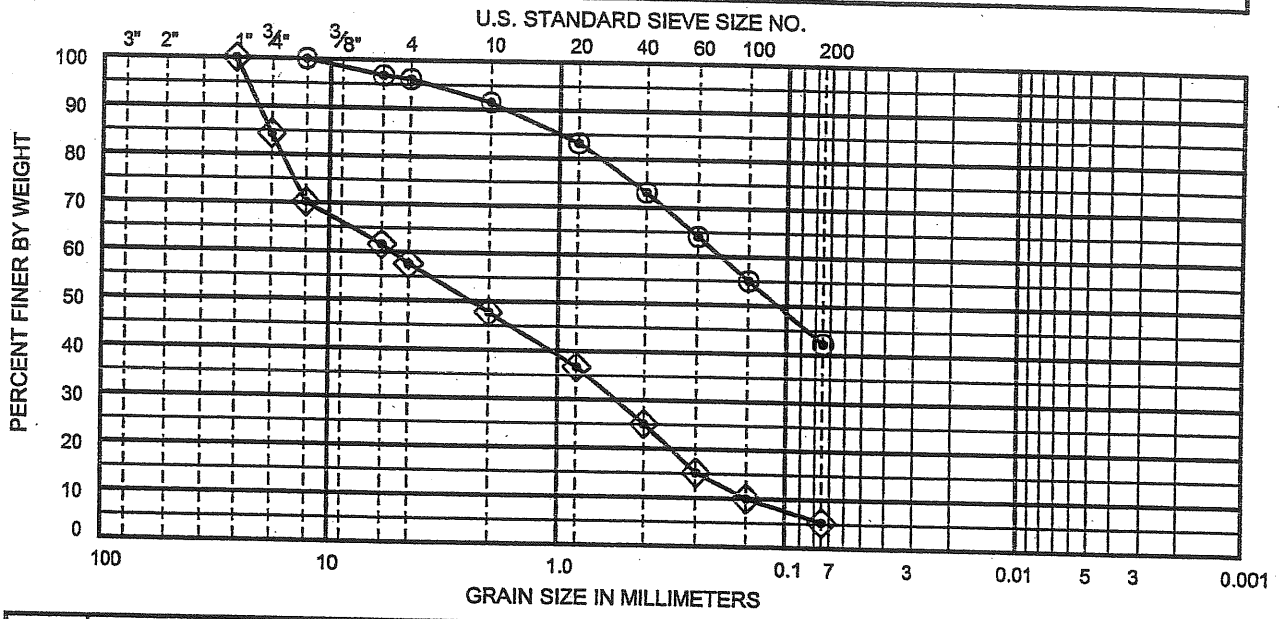
BORING NO.: B-5

JOB NO. 01-0304 S

S.W.COLE ENGINEERING, INC.

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	

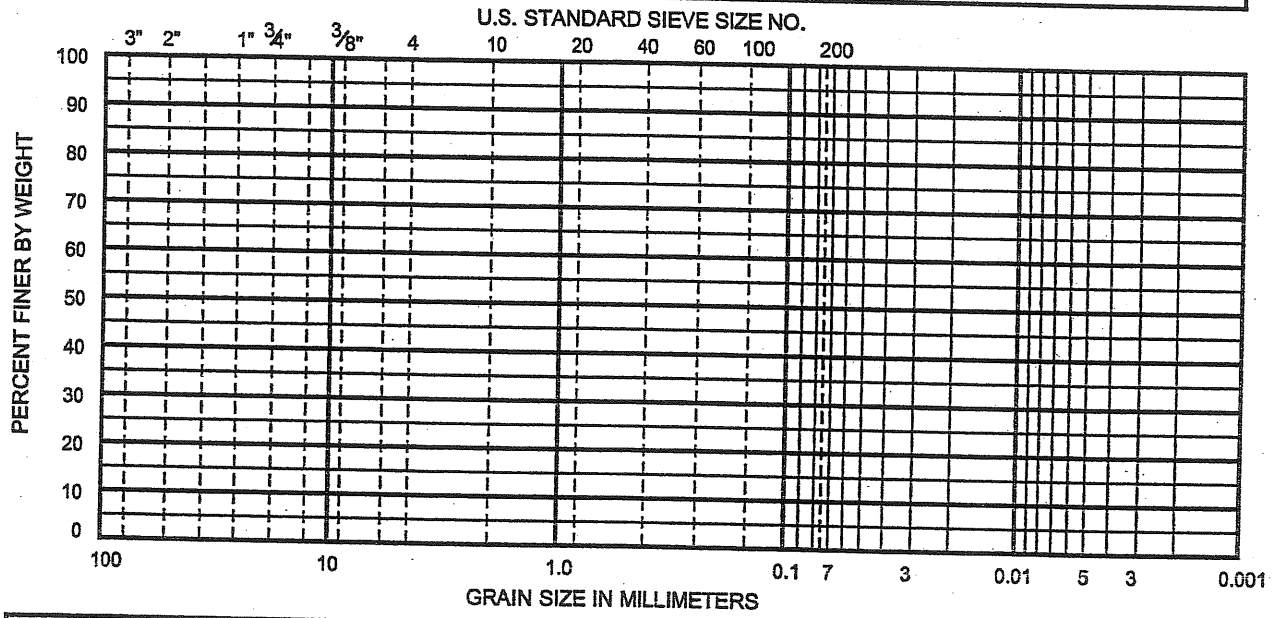


PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION	W %
◉	B-1	S-4		SAND AND SILT WITH TRACE OF GRAVEL	9.2%
◈	B-5	S-1		SAND AND GRAVEL WITH SOME SILT	3.8%

S.W.COLE ENGINEERING, INC.

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION	W %

01-0304 GS.dwg 6/19/2001 2:43 PM Danny Ray, S. W. Cole Engineering, Inc.

DRAFT

APPENDIX C

2002 EXPLORATION (B-108)
MADE FOR PROPOSED PARKING GARAGE
(BY S. W. COLE ENGINEERING, INC. #02-0067)

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-108
SHEET: 1 OF 3
PROJECT NO.: 02-0067 S
DATE START: 2/8/2002
DATE FINISH: 2/11/2002
ELEVATION: 120.0 +/-
SWC REP.: KGB

PROJECT / CLIENT: PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CRESCENT/CONGRESS STREETS - PORTLAND, ME
DRILLING FIRM: GREAT WORKS TEST BORING INC. DRILLER: WAYNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
CASING									.3'	ASPHALT PAVEMENT
	S-1	2"	2"	1.1'	50/2"				4.0'	BROWN GRAVELLY SAND SOME SILT (FILL)
	S-2	24"	18"	7.0'	5	7	6	6		BROWN SAND SOME SILT TRACE GRAVEL (FILL) ~MEDIUM DENSE~ W=6.8%
	S-3	24"	18"	12.0'	9	7	9	14	13.5'	
									15.0'	PROBABLE REINFORCED CONCRETE FOOTING
	S-4	24"	16"	17.0'	16	36	15	22		BROWN SILTY SAND SOME GRAVEL TRACE CLAY (TILL) ~VERY DENSE~
OPEN HOLE	S-5	24"	0	22.0'	31	28	34	30		
	S-6	24"	22"	27.0'	10	20	24	32		~DENSE~
	S-7	24"	24"	32.0'	7	9	13	16	33.0'	W=10.8% ~MEDIUM DENSE~
	S-8	24"	20"	37.0'	6	7	8	9	38.0'	GRAY SILT AND SAND SOME CLAY TRACE GRAVEL (TILL) ~MEDIUM DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLES THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-108

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-108
SHEET: 2 OF 3
PROJECT NO.: 02-0067 S
DATE START: 2/8/2002
DATE FINISH: 2/11/2002
ELEVATION: 120.0 +/-
SWC REP.: KGB

PROJECT / CLIENT: PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CRESCENT/CONGRESS STREETS - PORTLAND, ME
DRILLING FIRM: GREAT WORKS TEST BORING INC. DRILLER: WAYNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										~VERY DENSE~
	S-9	24"	10"	42.0'	17	25	32	25		GRAY SAND AND SILT TRACE TO SOME GRAVEL TRACE CLAY (TILL)
	S-10	24"	24"	47.0'	17	14	17	17		~DENSE~
	S-11	24"	24"	52.0'	11	16	24	31		
	S-12	24"	24"	57.0'	16	34	37	44		~VERY DENSE~ W=10.1%
	S-13	21"	17"	61.8'	11	25	41	50/3"		
	S-14	24"	24"	67.0'	12	19	22	32		~DENSE~
	S-15	24"	24"	72.0'	12	25	26	30		~VERY DENSE~
	S-16	24"	24"	77.0'	11	16	18	22		~DENSE~

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLES THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-108

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-108
SHEET: 3 OF 3
PROJECT NO.: 02-0067 S
DATE START: 2/8/2002
DATE FINISH: 2/11/2002
ELEVATION: 120.0 +/-
SWC REP.: KGB

PROJECT / CLIENT: PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER
LOCATION: CRESCENT/CONGRESS STREETS - PORTLAND, ME
DRILLING FIRM: GREAT WORKS TEST BORING INC. DRILLER: WAYNE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	S-17	24"	24"	82.0'	10	14	19	22		GRAY SAND AND SILT TRACE TO SOME GRAVEL TRACE CLAY (TILL)
	S-18	24"	24"	87.0'	12	18	13	24		~DENSE~
	S-19	24"	24"	92.0'	15	16	18	24		
	S-20	24"	22"	102.0'	16	27	37	45	102.0'	~VERY DENSE~
										BOTTOM OF EXPLORATION AT 102.0' - NOT REFUSAL

NOTE: THREE PIEZOMETERS INSTALLED

B108A AT 100'
5' SCREEN
BENONITE SEAL 91'-93'

B108B AT 65'
5' SCREEN
BENONITE SEALS 66'-67' AND 57'-58'

B108C AT 30'
5' SCREEN
BENONITE SEALS 31'-32' AND 20'-23'

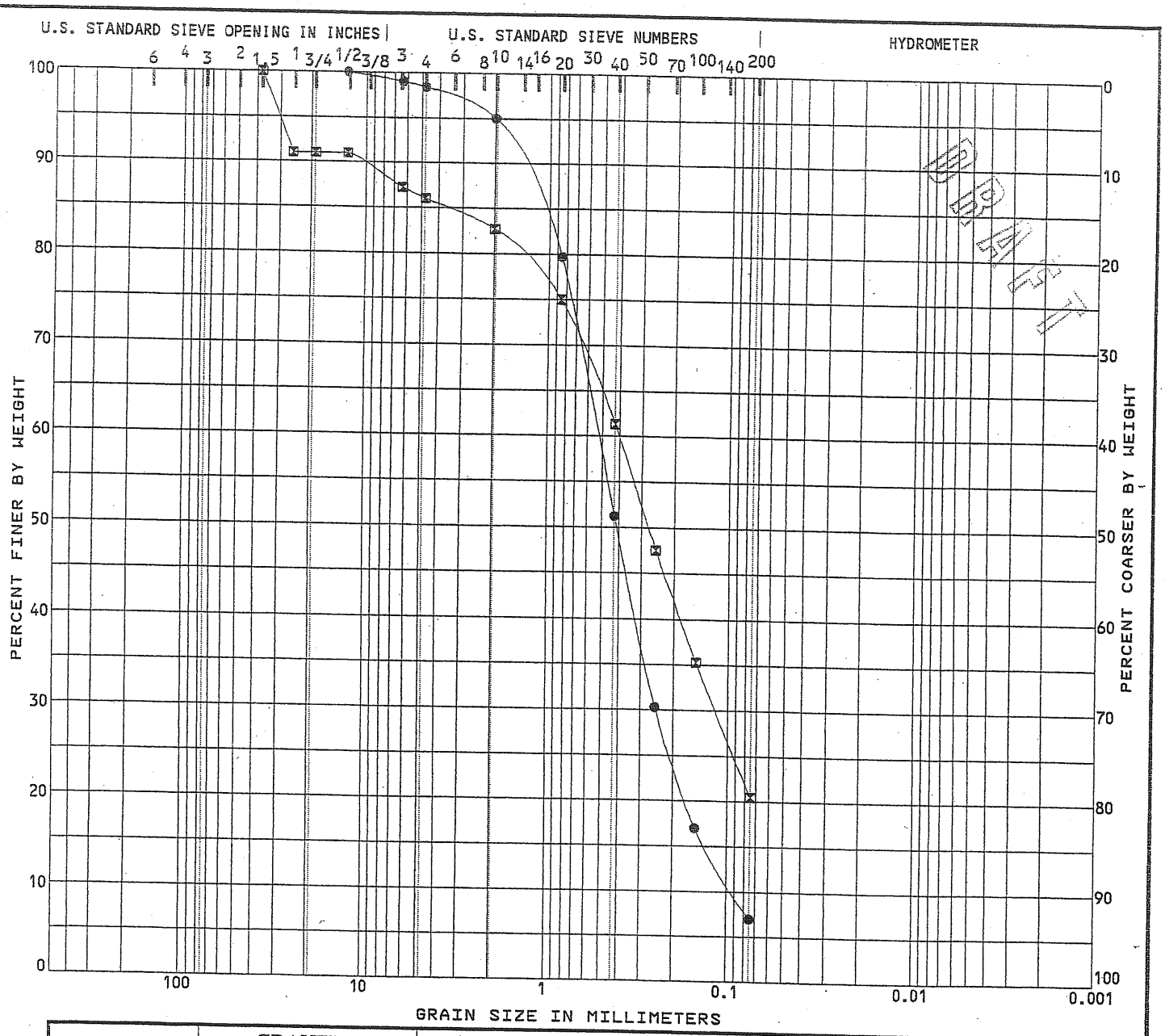
SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLES THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-108



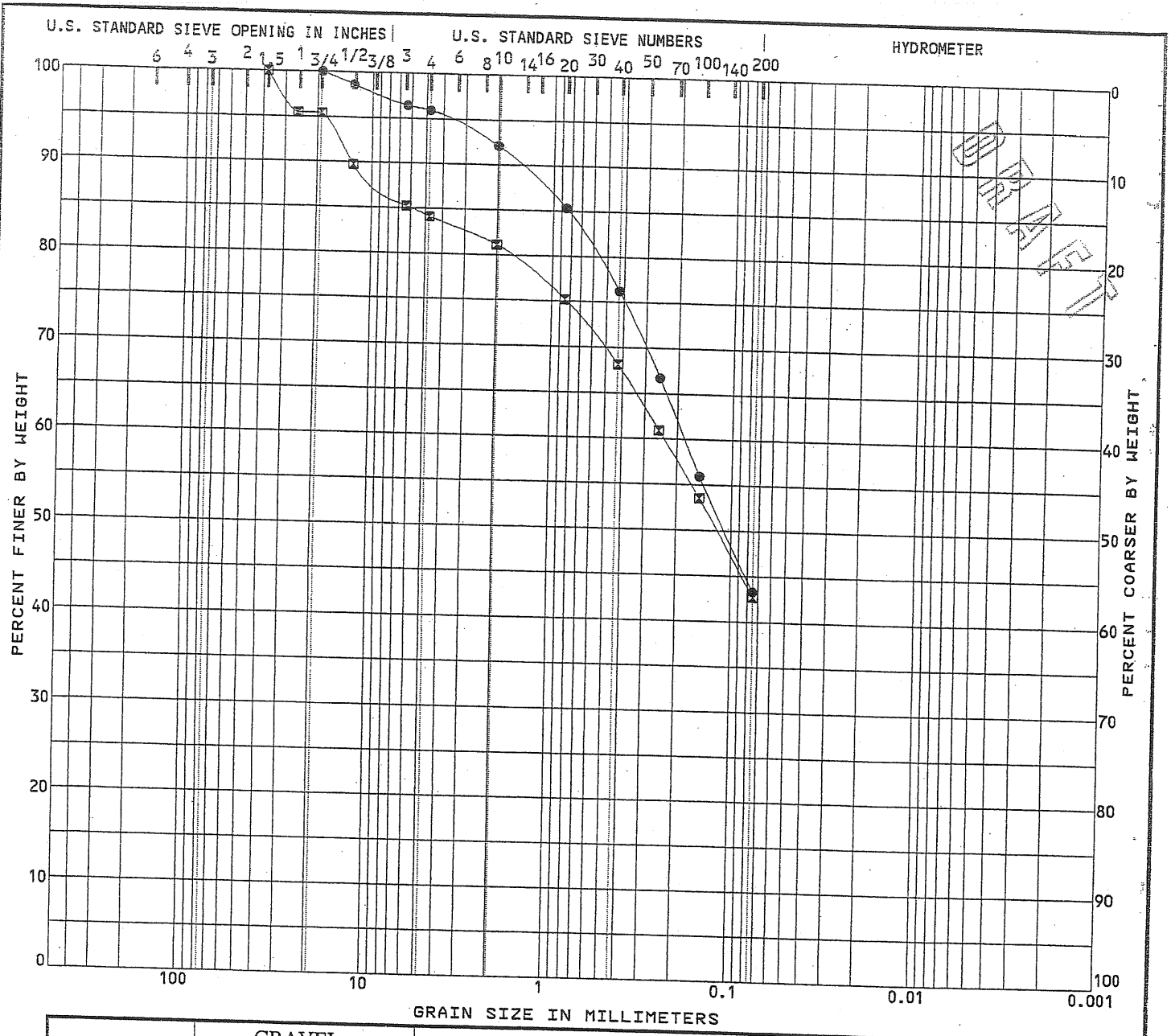
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	WC%	LL	PL	PI	Cc	Cu
●	B-108, S-3 10-12'	SAND with some silt and trace gravel	6.8				1.26	5.7
⊠	B-108, S-7 30-32'	Gravelly silty SAND	10.8					

Specimen Identification		D100	D60	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	B-108, S-3 10-12'	12.70	0.53	0.247	0.0923	1.6	91.4	7.0	
⊠	B-108, S-7 30-32'	37.50	0.40	0.117		14.0	65.5	20.5	

S.W.COLE ENGINEERING, INC.

Project Maine Medical Center/Parking Garage	Location Portland, Maine
SWC Job No. 02-0067	Sheet No. 6
Date February 25, 2002	GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	WC%	LL	PL	PI	Cc	Cu
●	B-108, S-12 50-57'	SAND and SILT with trace gravel	10.1					
☒	B-108, S-20 100-102'	Gravelly SILT and SAND	8.9					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-108, S-12 50-57'	19.00	0.18			4.1	52.6	43.3	
☒	B-108, S-20 100-102'	37.50	0.23			15.9	41.4	42.7	

S.W.COLE
ENGINEERING, INC.

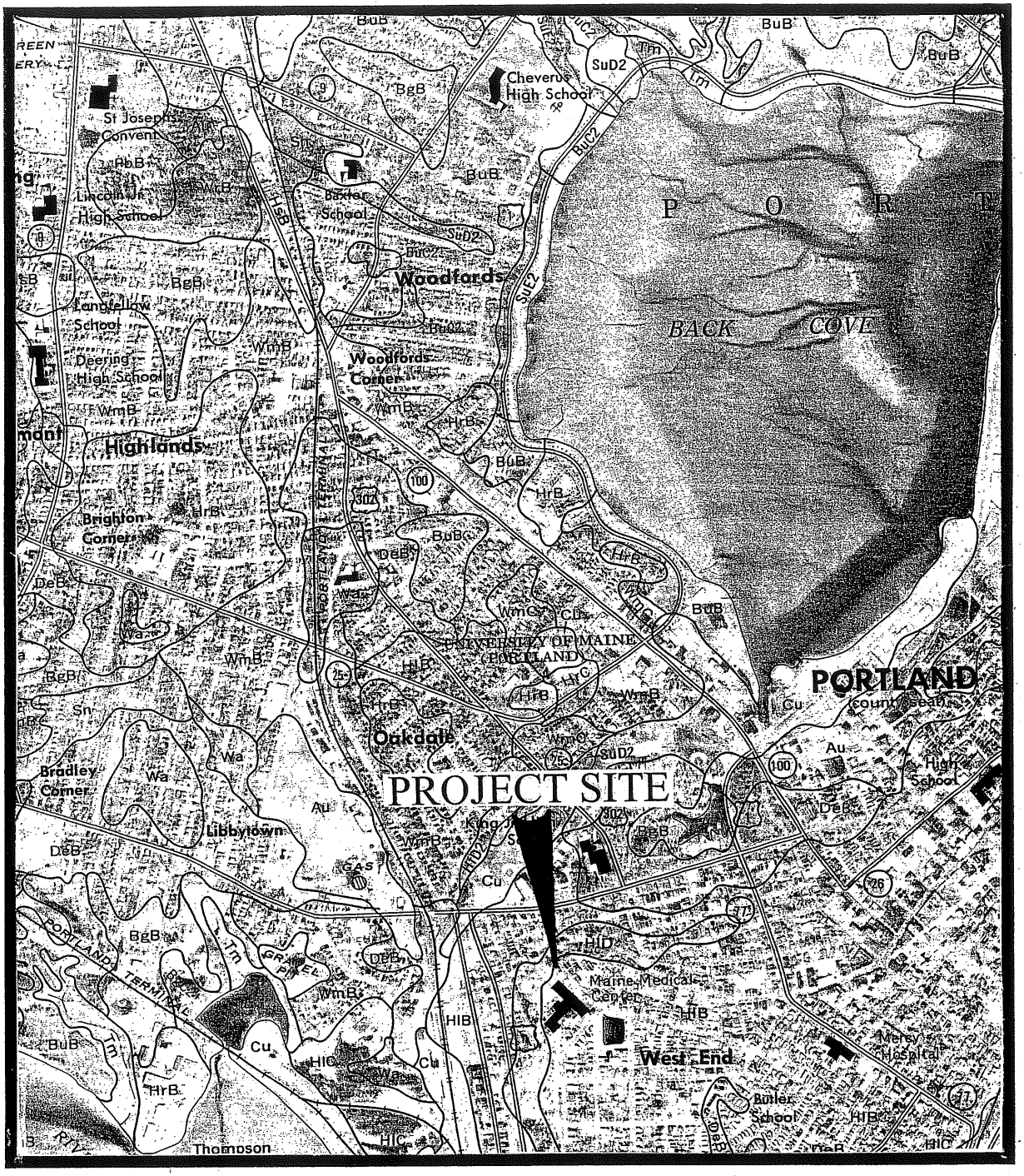
Project **Maine Medical Center/Parking Garage** Location **Portland, Maine**

SWC Job No. **02-0067** Sheet No. **7**

Date **February 25, 2002**

GRADATION CURVES

FIGURE 2



MEDIUM INTENSITY SOIL SURVEY

CUMBERLAND COUNTY

SHEET 82

SCALE 1:20,000

Sebago Technics

Engineering & Planning for the Future

Section 12

Stormwater Management

Section 12

Stormwater Management

General

This stormwater runoff evaluation report has been prepared for the Maine Medical Center (MMC) to evaluate stormwater runoff associated with the comprehensive facilities construction project at its Bramhall Street campus. The hospital is planning the following improvements:

- A four-story, 192,000 square foot building addition for obstetrics and newborn services, referred to as the Charles Street addition. The Charles Street project also includes improvements to the Richards Wing/admitting lobby. In order to construct this addition, Charles Street will be discontinued and Ellsworth Street will be relocated as shown on the project plans.
- A new parking garage to accommodate 512 additional parking spaces for patients and visitors. The new garage will be located immediately east of and connected to the existing parking garage on Congress Street. A pedestrian bridge will lead from both garages to the main hospital building.
- A new central utility plant, located on Gilman Street, which will provide a central heating/cooling facility for the campus.
- A new helicopter landing pad to be constructed on the top level of the existing parking garage on Congress Street.
- Reconfiguration of the main entrances to the hospital and lobbies.

The proposed development of the site will result in a net increase in impervious area of approximately 0.85 acre. This increase in impervious area is primarily attributed to the footprint of the proposed parking garage (27,300 square feet) and the footprint of the proposed central utility plant (7,000 square feet). The remaining increase in impervious area is attributed to the construction of the Charles Street addition, the relocation of Ellsworth Street, and the reconfiguration of the main entrance to the hospital.

Site Characteristics

The project site occupies an area bounded by Congress Street, Wescott Street, Charles Street, Ellsworth Street, Gilman Street and Crescent Street in Portland. The site is located in a densely developed urban setting consisting of hospital and office buildings with their associated parking and landscaped areas, public roadways and multi family residential housing. The undeveloped areas of the site consist of steeply sloped land abutting Congress Street and Gilman Street. Ground cover in this area consists primarily of grass, brush and evergreen tree growth.

The proposed Parking Garage occupies a steeply sloped undeveloped area adjacent to Congress Street, and the Central Utility plant occupies a steeply sloped undeveloped area abutting Gillman Street at a point opposite A Street. The remaining site improvements occur on previously developed areas of the site.

The subject site is located at a high point in the west end of the Portland Peninsula. Runoff from the project site is collected through a series of roof drains and catch basins and conveyed to combined sanitary/stormwater sewers located within public streets abutting the site. There are currently no facilities installed to provide stormwater quality treatment to runoff from the site.

A 15,000-gallon stormwater detention tank was installed in 1983 on the steeply sloped, wooded area adjacent to Gilman Street at the location of the proposed Central Utility Plant. Based on conversations with City of Portland Public Works staff, it is our understanding that this detention tank does not function as intended to provide attenuation of stormwater runoff. This tank is included in the pre-development runoff analysis attached to this report. The hydraulic characteristics of this facility are based on design plans.

The only existing point of connection to the City's separated storm drain system is located at the intersection of A Street and Gilman Street. This sewer was installed by the City of Portland Public Works Department in 2000-2001 as part of the St. John Street Sewer Separation Project. The City of Portland Public Works Department has indicated that this sewer was designed and constructed for the purpose of separating storm drainage and sanitary sewer flow from the Maine Medical Center Campus.

The enclosed pre-development and post-development watershed maps and USGS topographic map depict the general drainage patterns and infrastructure in the project area.

Soils

Soil classifications within the project area were referenced from the Cumberland County Medium Intensity Soil Survey. The site is primarily comprised of Hinckley gravelly sand loam. The project geotechnical evaluation report indicates significant depths of granular fill overlaying glacial till. For modeling purposes of this report, the soils were considered hydraulic soil groups A consistent with the Cumberland County soil survey.

Stormwater Management

In order to evaluate drainage characteristics in pre and post-development conditions, a quantitative analysis was performed to determine peak rates of runoff for the 2, 10 and 25-year storm events. Runoff calculations were performed following the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds, Technical Release #55" and HydroCAD Stormwater Modeling System software.

The 24-hour rainfall values utilized in the hydrologic model are as follows.

Storm Frequency Precipitation (in./24 hr)	
2-year	3.0
10-year	4.7
25-year	5.5

Nineteen watersheds were analyzed in the pre-development condition, and twenty-one watersheds in the post-developed condition. The watershed delineations are based on the topography of the site, record drawings, and field surveys of the drainage infrastructure. Watershed delineations along the hospital building rooftops are based on visible roof drain locations and record design drawings. Due to the age of a number of buildings, records indicating the locations of roof drain connections to the surrounding sewer system are not available. In these cases, the assumed watershed delineations were made based observations of the rooflines and the surrounding topography and sewer infrastructure.

Seven Study Points, identified on the attached watershed plans and hydrologic model output as points SP-1 through SP-7, were selected for the evaluation pre and post-developed runoff conditions. The Study Points represent locations where stormwater runoff from the project site enters the public drainage infrastructure system. In most cases, the capacity of the existing combined sewers is small relative the area draining to them under existing conditions. In these cases, the study point represents the total stormwater discharge at the study point, including both gutter flow and flow in the sewer.

Study Point SP-1 represents the point where stormwater runoff from the site enters a combined sewer at the intersection of Wescott Street and Crescent Street. The study point represents runoff at a manhole identified as DMH-99 on the project plans. The sewer outlet from this manhole is a 12" cement line that drains in a westerly direction along Crescent Street, eventually draining to Park Avenue via sewers in Ellsworth Street, Congress Street and Weymouth Street.

Study Point SP-2 represents the point where runoff from the existing Maine Medical Center parking garage enters a combined sewer at the intersection of Congress Street and Forest Street. The study point represents runoff at manhole SMH-13 on the project plans. The sewer outlet from this manhole is an 18" reinforced concrete pipe that drains in a northerly direction along Forest Street to Park Avenue.

Study Point SP-3 represents the point where runoff from areas of the project site east of the existing emergency room enters the combined sewer system at the intersection of Gilman Street and Congress Street. At this point, runoff within the sewer system discharges in a northerly direction along Gilman Street to Park Avenue. Runoff in the roadway that bypasses the catch basins at the intersection discharges in a westerly direction along Congress Street to St. John Street.

Study Point SP-4 represents runoff at the intersection of Gilman Street and A Street at the upstream end of an existing 15" separate storm drainage system constructed by the City of Portland in 2001 as part of the St. John Street sewer separation project. The storm drain was extended along A Street from its intersection with St. John Street to a drainage manhole in Gilman Street opposite the location of the proposed central utility plant. This manhole is identified as SMH-27 on the project existing conditions plan. It is our understanding that this storm drain was extended to the hospital property specifically for the purpose of providing a point of connection for separated stormwater runoff from the hospital. Under existing conditions, this storm drain only conveys runoff entering two catch basins draining Gilman Street south of its intersection with A Street. Under post-development conditions, runoff from areas of the site, including the existing emergency room parking area, L. L. Bean wing, and service areas abutting the proposed central utility plant are directed to the A Street storm drain.

Study Point SP-5 represents the point where runoff from the site enters the combined sewer system at the intersection of Bramhall Street and Chadwick Street. The proposed development of the site does not affect runoff at this point. The study point represents runoff at a manhole structure identified as SMH-8; the sewer outlet from this manhole is a 15 cement line that drains in an easterly direction along Bramhall Street to Brackett Street.

Study Point SP-6 represents runoff at the intersection of Ellsworth Street and Wescott Street. Runoff currently enters the combined sewer system via manholes in Ellsworth Street and drains in an easterly direction along Ellsworth Street towards its intersection with Congress Street.

Study Point SP-7 represents runoff at the intersection of Russell Street and Brackett Street. Runoff entering the combined sewer system drains in a southeasterly direction along Brackett Street.

The areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development. Due to the highly developed nature of the site, the time of concentration in some watersheds is less than five minutes. A minimum time of concentration of five minutes was used in these cases.

Table 1 summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

Table 1 - Stormwater Runoff Summary Table: Pre-Development vs. Post-Development

Study Point	Total Watershed Area (Ac)		Avg. Weighted Curve No. (Cn)		Peak Rates of Runoff (cfs)								
					2-Year			10-Year			25-Year		
						Post			Post			Post	
	Pre	Post	Pre	Post	Pre	wo/d	w/d	Pre	wo/d	w/d	Pre	wo/d	w/d
1P	0.54	.77	88	82	1.2	1.3		2.1	2.6		2.6	3.2	
2P	9.70	7.71	88	91	18.7	15.5		33.0	27.2		39.7	32.6	
3P	6.10	1.40	86	70	11.6	1.3		23.6	3.1		27.2	4.0	
4P	2.20	8.60	62	85	<1	16.8		3.0	29.9		4.3	33.6	
5P	2.00	2.00	92	92	5.1	5.1		8.7	8.7		10.3	10.3	
6P	1.18	1.39	90	92	2.7	3.2		4.8	5.6		5.7	6.7	
7P	0.25	0.10	84	98	<1	<1		<1	<1		1.1	<1	

Stormwater modeling results indicate that the peak rates of runoff in the developed condition will be reduced from pre-developed runoff rates in the combined sewers at Study Points SP-2, SP-3, SP-5 and SP-7 during the 2-year, 10-year and 25-year storm events. This reduction is due primarily to the realignment of the public roadways on the site and the separation of stormwater runoff from existing developed areas to the dedicated storm drain line at the intersection of Gilman Street and A Street (Study Point SP-4).

The stormwater modeling results indicate minor increases in the peak rate of runoff at Study Points SP-1 and SP-6 during the 2, 10, and 25-year storm events. This increase in the post-development runoff is due to the proposed vacation of Charles Street and realignment of Ellsworth Street and the resulting alteration to existing drainage patterns.

The stormwater analysis results indicate an increase in runoff at Study Point SP-4 which represents runoff in the A Street storm sewer at the intersection of Gilman Street and A Street. This existing storm sewer was specifically designed and constructed for a future separation of storm drainage from the hospital property. Under proposed condition, this storm drain conveys runoff from the existing emergency room parking area, the L. L. Bean Wing and the service drive providing access from Crescent Street to Gilman Street at the rear of the L. L. Bean Wing. This design is consistent with improvements planned as part of the St. John Street sewer separation project, but not completed as part of the City's sewer construction project. The proposed development also directs rooftop runoff from the proposed Charles Street building to the separate storm drainage system in A Street. This design provides stormwater separation for approximately 6.3 acres of existing development that is currently tributary to combined sewers in Crescent Street and Congress Street.

Stormwater Quality

The project site is not located within a watershed at risk from development as defined by the Maine Department of Environmental Protection. Stormwater quality treatment is, therefore, not required under State stormwater regulations. However, stormwater quality treatment is required by the City of Portland's stormwater design criteria related to proposed parking areas and to replace the existing stormwater quantity detention tank which will be removed as part of the Central Utility Plant construction.

To meet the stormwater quality treatment requirements for the site, two Hydro-International Downstream Defender stormwater treatment units are proposed to treat runoff from both proposed and existing impervious surfaces.

A 6-foot diameter Downstream Defender Unit is proposed to treat runoff generated from the paved surface of the proposed parking garage. Runoff from the parking garage will be collected in the structure's roof drainage system and directed to a treatment unit installed at the Congress Street parking level. The treated stormwater will discharge to an existing 15" combined sewer located on hospital property adjacent to Congress Street and tributary to Study Point SP2.

A 10-foot diameter Downstream Defender Unit is proposed to treat runoff tributary to Study Point SP-4. The unit is proposed at a location adjacent to Gilman Street and discharges to the separated storm sewer manhole at the intersection of Gilman Street and A Street. This unit provides stormwater quality treatment to runoff from approximately 4.93 acres of previously untreated impervious surfaces.

The proposed treatment units have been sized based on the Maine Department of Environmental Protection (MDEP) criteria to provide a 60% total suspended solids (TSS) removal efficiency for runoff generated by a 1-year storm. The units have also been sized such that the 25-year discharge to each unit is less than the manufacturer's published capacity flow rate. Table 2 below summarizes the design flow rates for the stormwater treatment units.

Table 2 Stormwater Treatment Unit Summary

Unit	Downstream Defender Treatment Unit Capacity (cfs)			Post Development Flow rates (cfs)	
	50% TSS Removal ($Q_{1\text{-year}}$)	60% TSS Removal ($Q_{1\text{-year}}$)	Unit Capacity ($Q_{25\text{-year}}$)	1year	25-year
6-ft (SP-2)	3.86	3.58	8.0	1.51	3.38
10-ft (SP-4)	13.84	12.85	25.0	10.66	22.85

Summary

The proposed development of the Maine Medical Center Bramhall Campus will result in significant reductions in the stormwater runoff entering the existing combined sewers within the public right-of-ways surrounding the site. The analysis indicates that the peak rate of runoff in the developed condition will be less than pre-developed runoff rates at four of the seven project study points (Study Points for Study Points SP-2, SP-3, SP-5 and SP-7).

Insignificant increases in stormwater water runoff are anticipated at Study Point SP-1 representing the intersection of Crescent street and Wescott Street and at Study Point SP-6 representing the intersection Ellsworth Street and Wescott Street. The increases are considered insignificant based on the relatively small flow rates involved.

The proposed development will direct runoff from approximately 6.3 acres of existing urban development away from the combined sewers in Crescent Street, Ellsworth Street and Congress Street to a separate storm drainage system in A Street. This storm drain, identified as Study Point SP-4 in the hydrologic model, was designed and constructed as part of the City of Portland's St. John Street sewer separation project for the purpose of providing a fully separated storm sewer to drain the hospital campus site. The drainage infrastructure proposed as part of the Maine Medical Center expansion project is consistent with the design plans for the sewer separation project.

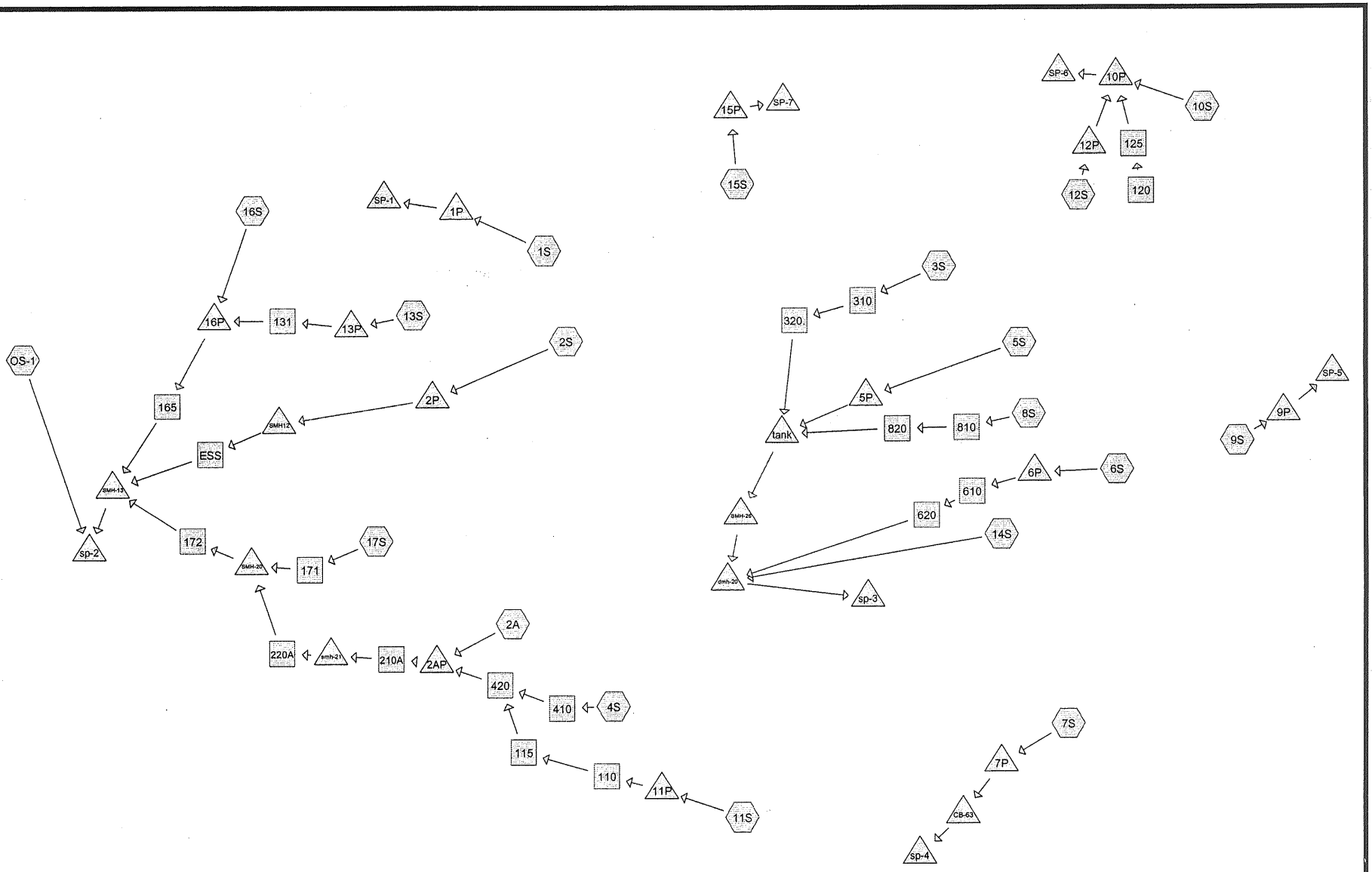
Stormwater quality treatment for the site is provided by two Downstream Defender treatment units. A 6-foot unit is proposed to treat the impervious area associated with the proposed parking garage. A 10-foot diameter unit is proposed to provide stormwater treatment for runoff tributary to the A Street sewer. This unit provides treatment to approximately 4.93 acres of previously untreated impervious surfaces from the northeastern portion of the site, which are currently tributary to the City's combined sewer system.

Prepared by:

SEBAGO TECHNICS, INC.

Daniel L. Riley, P.E.
Senior Project Manager

DLR/APP:app/jc
Enclosure



Subcat Reach Pond Link

Drainage Diagram for 01046-PRE

Prepared by {enter your company name here} 12/15/03

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=3.00"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=88 Area=0.539 ac Runoff= 1.15 cfs 0.076 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.576 ac Runoff= 1.69 cfs 0.124 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=89 Area=0.672 ac Runoff= 1.49 cfs 0.100 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=98 Area=0.401 ac Runoff= 1.17 cfs 0.087 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 1.54 cfs 0.114 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=94 Area=2.860 ac Runoff= 7.63 cfs 0.529 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=43 Area=0.250 ac Runoff= 0.00 cfs 0.000 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 0.64 cfs 0.064 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 2.55 cfs 0.171 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 5.07 cfs 0.345 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=86 Area=0.767 ac Runoff= 1.50 cfs 0.099 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.216 ac Runoff= 0.63 cfs 0.047 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.415 ac Runoff= 1.21 cfs 0.090 af

Subcatchment 13S: (new node)
Tc=5.0 min CN=43 Area=0.210 ac Runoff= 0.00 cfs 0.000 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=71 Area=1.390 ac Runoff= 1.11 cfs 0.079 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=84 Area=0.254 ac Runoff= 0.45 cfs 0.030 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=61 Area=0.506 ac Runoff= 0.12 cfs 0.013 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 2.69 cfs 0.198 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 11.55 cfs 0.894 af

Reach 110: (new node)
Inflow= 0.63 cfs 0.047 af
Length= 60.0' Max Vel= 3.6 fps Capacity= 3.86 cfs Outflow= 0.62 cfs 0.047 af

Reach 115: (new node)
Inflow= 0.62 cfs 0.047 af
Length= 50.0' Max Vel= 3.6 fps Capacity= 3.86 cfs Outflow= 0.62 cfs 0.047 af

Reach 120: (new node)
Length= 55.0' Max Vel= 0.0 fps Capacity= 5.65 cfs Outflow= 0.00 cfs 0.000 af

Reach 125: (new node)
Inflow= 0.00 cfs 0.000 af
Length= 172.0' Max Vel= 0.0 fps Capacity= 0.92 cfs Outflow= 0.00 cfs 0.000 af

Reach 131: (new node)
Inflow= 0.00 cfs 0.000 af
Length= 30.0' Max Vel= 0.4 fps Capacity= 0.21 cfs Outflow= 0.00 cfs 0.000 af

Reach 165: (new node)
Inflow= 0.14 cfs 0.013 af
Length= 215.0' Max Vel= 4.3 fps Capacity= 3.01 cfs Outflow= 0.12 cfs 0.013 af

Reach 171: (new node)
Inflow= 2.69 cfs 0.198 af
Length= 31.0' Max Vel= 14.8 fps Capacity= 29.32 cfs Outflow= 2.68 cfs 0.198 af

Reach 172: (new node)
Inflow= 6.35 cfs 0.483 af
Length= 32.0' Max Vel= 18.8 fps Capacity= 28.85 cfs Outflow= 6.35 cfs 0.483 af

Reach 210A: (new node)
Inflow= 3.78 cfs 0.285 af
Length= 150.0' Max Vel= 20.3 fps Capacity= 39.83 cfs Outflow= 3.77 cfs 0.285 af

Reach 220A: (new node)
Inflow= 3.77 cfs 0.285 af
Length= 168.0' Max Vel= 9.5 fps Capacity= 13.64 cfs Outflow= 3.73 cfs 0.285 af

Reach 310: (new node)
Inflow= 1.17 cfs 0.087 af
Length= 195.0' Max Vel= 5.0 fps Capacity= 4.73 cfs Outflow= 1.14 cfs 0.086 af

Reach 320.: (new node)
Inflow= 1.14 cfs 0.086 af
Length= 56.0' Max Vel= 19.2 fps Capacity= 32.06 cfs Outflow= 1.14 cfs 0.086 af

Reach 410: (new node) Inflow= 1.54 cfs 0.114 af
Length= 110.0' Max Vel= 4.6 fps Capacity= 3.86 cfs Outflow= 1.51 cfs 0.114 af

Reach 420: (new node) Inflow= 2.13 cfs 0.160 af
Length= 14.0' Max Vel= 8.4 fps Capacity= 24.14 cfs Outflow= 2.12 cfs 0.160 af

Reach 610: (new node) Inflow= 0.00 cfs 0.000 af
Length= 28.0' Max Vel= 0.3 fps Capacity= 26.83 cfs Outflow= 0.00 cfs 0.000 af

Reach 620: (new node) Inflow= 0.00 cfs 0.000 af
Length= 265.0' Max Vel= 0.1 fps Capacity= 0.75 cfs Outflow= 0.00 cfs 0.000 af

Reach 810: (new node) Inflow= 2.55 cfs 0.171 af
Length= 169.0' Max Vel= 15.4 fps Capacity= 16.82 cfs Outflow= 2.53 cfs 0.171 af

Reach 820: (new node) Inflow= 2.53 cfs 0.171 af
Length= 141.0' Max Vel= 13.3 fps Capacity= 13.70 cfs Outflow= 2.52 cfs 0.171 af

Reach ESS: (new node) Inflow= 1.34 cfs 0.100 af
Length= 265.0' Max Vel= 8.5 fps Capacity= 3.10 cfs Outflow= 1.33 cfs 0.100 af

Pond 1P: (new node) Inflow= 1.15 cfs 0.076 af
Primary= 1.15 cfs 0.076 af

Pond 2AP: (new node) Inflow= 3.78 cfs 0.285 af
Primary= 3.78 cfs 0.285 af

Pond 2P: (new node) Peak Storage= 131 cf Inflow= 1.49 cfs 0.100 af
Primary= 1.34 cfs 0.100 af Secondary= 0.00 cfs 0.000 af Outflow= 1.34 cfs 0.100 af

Pond 5P: (new node) Inflow= 7.63 cfs 0.529 af
Primary= 7.63 cfs 0.529 af

Pond 6P: (new node) Inflow= 0.00 cfs 0.000 af
Primary= 0.00 cfs 0.000 af

Pond 7P: (new node) Inflow= 0.64 cfs 0.064 af
Primary= 0.64 cfs 0.064 af

Pond 9P: (new node) Inflow= 5.07 cfs 0.345 af
Primary= 5.07 cfs 0.345 af

Pond 10P: (new node) Inflow= 2.72 cfs 0.189 af
Primary= 2.72 cfs 0.189 af

Pond 11P: (new node) Inflow= 0.63 cfs 0.047 af
Primary= 0.63 cfs 0.047 af

Pond 12P: (new node) Inflow= 1.21 cfs 0.090 af
Primary= 1.21 cfs 0.090 af

Pond 13P: (new node) Inflow= 0.00 cfs 0.000 af
Primary= 0.00 cfs 0.000 af

Pond 15P: (new node) Inflow= 0.45 cfs 0.030 af
Primary= 0.45 cfs 0.030 af

Pond 16P: (new node) Peak Storage= 10 cf Inflow= 0.12 cfs 0.013 af
Primary= 0.14 cfs 0.013 af Secondary= 0.00 cfs 0.000 af Outflow= 0.14 cfs 0.013 af

Pond CB-63: (new node) Inflow= 0.64 cfs 0.064 af
Primary= 0.64 cfs 0.064 af

Pond dmh-20: (new node) Inflow= 11.64 cfs 0.862 af
Primary= 11.64 cfs 0.862 af

Pond SMH-13: (new node) Inflow= 7.65 cfs 0.596 af
Primary= 7.65 cfs 0.596 af

Pond SMH-20: (new node) Inflow= 6.35 cfs 0.483 af
Primary= 6.35 cfs 0.483 af

Pond smh-21: (new node) Inflow= 3.77 cfs 0.285 af
Primary= 3.77 cfs 0.285 af

Pond SMH-26: (new node) Peak Storage= 102 cf Inflow= 10.73 cfs 0.783 af
Primary= 10.58 cfs 0.783 af Secondary= 0.00 cfs 0.000 af Outflow= 10.58 cfs 0.783 af

Pond SMH12: (new node) Inflow= 1.34 cfs 0.100 af
Primary= 1.34 cfs 0.100 af

Pond SP-1: (new node) Inflow= 1.15 cfs 0.076 af
Primary= 1.15 cfs 0.076 af

Pond sp-2: (new node) Inflow= 18.67 cfs 1.490 af
Primary= 18.67 cfs 1.490 af

Pond sp-3: (new node) Inflow= 11.64 cfs 0.862 af
Primary= 11.64 cfs 0.862 af

Pond sp-4: (new node) Inflow= 0.64 cfs 0.064 af
Primary= 0.64 cfs 0.064 af

Pond SP-5: (new node) Inflow= 5.07 cfs 0.345 af
Primary= 5.07 cfs 0.345 af

Pond SP-6: (new node) Inflow= 2.72 cfs 0.189 af
Primary= 2.72 cfs 0.189 af

Pond SP-7: (new node) Inflow= 0.45 cfs 0.030 af
Primary= 0.45 cfs 0.030 af

Pond tank: (new node) Peak Storage= 1,461 cf Inflow= 11.18 cfs 0.787 af
Primary= 10.73 cfs 0.783 af Secondary= 0.00 cfs 0.000 af Outflow= 10.73 cfs 0.783 af

Runoff Area = 21.928 ac Volume = 3.060 af Average Depth = 1.67"

Subcatchment 1S: (new node)

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 0.076 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.036	39	>75% Grass cover, Good, HSG A
0.061	48	Brush, Poor, HSG A
0.442	98	Paved parking & roofs
0.539	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.2		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	195	0.0300	3.5		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.6					**Direct Entry, DIRECT**
5.0	235	Total			

Subcatchment 2A: (new node)

Runoff = 1.69 cfs @ 12.07 hrs, Volume= 0.124 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.576	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	40	0.0430	1.5		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.6	170	0.0520	4.6		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.6	140	0.0100	3.8	1.31	**Circular Channel (pipe), PIPE C TO D** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	14	0.0450	13.7	24.14	**Circular Channel (pipe), PIPE D TO E** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
3.4					**Direct Entry, DIRECT**
5.0	364	Total			

Subcatchment 2S: (new node)

Runoff = 1.49 cfs @ 12.08 hrs, Volume= 0.100 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.568	98	Paved parking & roofs
0.104	39	>75% Grass cover, Good, HSG A
0.672	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.2		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.0	283	0.0580	4.9		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	16	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.4					**Direct Entry, DIRECT**
5.0	339	Total			

Subcatchment 3S: (new node)

Runoff = 1.17 cfs @ 12.07 hrs, Volume= 0.087 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.401	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	40	0.0875	2.0		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	218	0.0690	5.3		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	205	0.0370	9.5	7.42	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
5.0	463	Total			

Subcatchment 4S: (new node)

Runoff = 1.54 cfs @ 12.07 hrs, Volume= 0.114 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.528	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.7		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C**
					Paved Kv= 20.3 fps
2.4					**Direct Entry, DIRECT**
5.0	160	Total			

Subcatchment 5S: (new node)

Runoff = 7.63 cfs @ 12.07 hrs, Volume= 0.529 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
2.664	98	Paved parking & roofs
0.196	39	>75% Grass cover, Good, HSG A
2.860	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.6		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.7	0.93	**Circular Channel (pipe), PIPE B TO C**
					Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.4	63	0.0050	2.7	0.93	**Circular Channel (pipe), PIPE C TO D**
					Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
1.5					**Direct Entry, DIRECT**
5.0	453	Total			

Subcatchment 6S: (new node)

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.250	43	Woods/grass comb., Fair, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.3500	0.2		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	59	0.3720	3.0		**Shallow Concentrated Flow, SHALLOW B OT C** Woodland Kv= 5.0 fps
1.3					**Direct Entry, DIRECT**
5.0	99	Total			

Subcatchment 7S: (new node)

Runoff = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.456	98	Paved roads w/curbs & sewers
1.354	43	Woods/grass comb., Fair, HSG A
0.079	43	Woods/grass comb., Fair, HSG A
0.327	98	Paved roads w/curbs & sewers
2.216	62	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.7		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.7		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.9		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.7	266	0.0930	6.2		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
2.3					**Direct Entry, DIRECT**
5.0	638	Total			

Subcatchment 8S: (new node)

Runoff = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.973	98	Paved parking & roofs
0.152	43	Woods/grass comb., Fair, HSG A
0.025	39	>75% Grass cover, Good, HSG A
1.150	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE B TO C** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE D TO E** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.8					**Direct Entry, DIRECT**
5.0	399	Total			

Subcatchment 9S: (new node)

Runoff = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.191	39	>75% Grass cover, Good, HSG A
1.839	98	Paved parking & roofs
2.030	92	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	285	0.0100	3.8	1.31	**Circular Channel (pipe), PIPE B TO C** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.3	97	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.4					**Direct Entry, DIRECT**
5.0	422	Total			

Subcatchment 10S: (new node)

Runoff = 1.50 cfs @ 12.08 hrs, Volume= 0.099 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.195	61	1/4 acre lots, 38% imp, HSG A
0.542	98	Paved parking & roofs
0.012	39	>75% Grass cover, Good, HSG A
0.018	39	>75% Grass cover, Good, HSG A
0.767	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	40	0.0125	0.9		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	235	0.0210	2.9		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.0					**Direct Entry, DIRECT**
5.0	275	Total			

Subcatchment 11S: (new node)

Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.047 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.216	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.5					**Direct Entry, DIRECT**
5.0	90	Total			

Subcatchment 12S: (new node)

Runoff = 1.21 cfs @ 12.07 hrs, Volume= 0.090 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.415	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	24	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
5.0	54	Total			

Subcatchment 13S: (new node)

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.210	43	Woods/grass comb., Fair, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	40	0.2500	0.2		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	50	0.4400	3.3		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.3	43	0.2100	2.3		**Shallow Concentrated Flow, SHALLOW C TO D** Woodland Kv= 5.0 fps
0.5					**Direct Entry, DIRECT**
5.0	133	Total			

Subcatchment 14S: (new node)

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 0.079 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.728	98	Paved parking & roofs
0.429	39	>75% Grass cover, Good, HSG A
0.233	43	Woods/grass comb., Fair, HSG A
1.390	71	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1060	0.3		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.6	225	0.1940	6.6		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.6	168	0.0625	5.1		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
1.3					**Direct Entry, DIRECT**
5.0	433	Total			

Subcatchment 15S: (new node)

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 0.030 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.194	98	Paved parking & roofs
0.060	39	>75% Grass cover, Good, HSG A
0.254	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	15	0.0600	0.2		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	35	0.0420	3.3		**Shallow Concentrated Flow, SHALLOW B TO C** Unpaved Kv= 16.1 fps
3.4					**Direct Entry, DIRECT**
5.0	50	Total			

Subcatchment 16S: (new node)

Runoff = 0.12 cfs @ 12.12 hrs, Volume= 0.013 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.167	98	Paved parking & roofs
0.339	43	Woods/grass comb., Fair, HSG A
0.506	61	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	40	0.2500	0.2		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	71	0.5490	3.7		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.5	117	0.0420	4.2		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3					**Direct Entry, DIRECT**
5.0	228	Total			

Subcatchment 17S: (new node)

Runoff = 2.69 cfs @ 12.07 hrs, Volume= 0.198 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.918	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.0		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.0	5.24	**Circular Channel (pipe), PIPE C TO D** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
4.0					**Direct Entry, DIRECT**
5.0	188	Total			

Subcatchment OS-1: OS-1

Runoff = 11.55 cfs @ 12.14 hrs, Volume= 0.894 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
6.030	89	Urban commercial, 85% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.2		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.2		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.0		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.7		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.5		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Reach 110: (new node)

Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.047 af
Outflow = 0.62 cfs @ 12.08 hrs, Volume= 0.047 af, Atten= 2%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.6 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.7 min

Peak Depth= 0.27'
Capacity at bank full= 3.86 cfs
12.0" Diameter Pipe n= 0.012 Length= 60.0' Slope= 0.0100 '/'

Reach 115: (new node)

Inflow = 0.62 cfs @ 12.08 hrs, Volume= 0.047 af
Outflow = 0.62 cfs @ 12.09 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.6 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.6 min

Peak Depth= 0.27'
Capacity at bank full= 3.86 cfs
12.0" Diameter Pipe n= 0.012 Length= 50.0' Slope= 0.0100 '/'

Reach 120: (new node)

Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.0 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.0 fps, Avg. Travel Time= 0.0 min

Peak Depth= 0.00'
Capacity at bank full= 5.65 cfs
10.00' x 0.25' deep channel, n= 0.040 Length= 55.0' Slope= 0.0251 '/'

Reach 125: (new node)

Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.0 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.0 fps, Avg. Travel Time= 0.0 min

Peak Depth= 0.00'
Capacity at bank full= 0.92 cfs
6.0" Diameter Pipe n= 0.012 Length= 172.0' Slope= 0.0230 '/'

Reach 131: (new node)

Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.4 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.4 fps, Avg. Travel Time= 1.4 min

Peak Depth= 0.01'
Capacity at bank full= 0.21 cfs
4.0" Diameter Pipe n= 0.012 Length= 30.0' Slope= 0.0100 '/'

Reach 165: (new node)

Inflow = 0.14 cfs @ 12.11 hrs, Volume= 0.013 af
Outflow = 0.12 cfs @ 12.16 hrs, Volume= 0.013 af, Atten= 15%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.3 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 1.5 min

Peak Depth= 0.09'
Capacity at bank full= 3.01 cfs
8.0" Diameter Pipe n= 0.012 Length= 215.0' Slope= 0.0530 '/'

Reach 171: (new node)

Inflow = 2.69 cfs @ 12.07 hrs, Volume= 0.198 af
Outflow = 2.68 cfs @ 12.07 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.8 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.6 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.26'
Capacity at bank full= 29.32 cfs
15.0" Diameter Pipe n= 0.012 Length= 31.0' Slope= 0.1755 '/'

Reach 172: (new node)

Inflow = 6.35 cfs @ 12.08 hrs, Volume= 0.483 af
Outflow = 6.35 cfs @ 12.09 hrs, Volume= 0.483 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 18.8 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.2 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.40'
Capacity at bank full= 28.85 cfs
15.0" Diameter Pipe n= 0.012 Length= 32.0' Slope= 0.1700 '/'

Reach 210A: (new node)

Inflow = 3.78 cfs @ 12.08 hrs, Volume= 0.285 af
Outflow = 3.77 cfs @ 12.08 hrs, Volume= 0.285 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 20.3 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 7.7 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.26'
Capacity at bank full= 39.83 cfs
15.0" Diameter Pipe n= 0.012 Length= 150.0' Slope= 0.3240 '/'

Reach 220A: (new node)

Inflow = 3.77 cfs @ 12.08 hrs, Volume= 0.285 af
Outflow = 3.73 cfs @ 12.09 hrs, Volume= 0.285 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.5 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.6 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.45'
Capacity at bank full= 13.64 cfs
15.0" Diameter Pipe n= 0.012 Length= 168.0' Slope= 0.0380 '/'

Reach 310: (new node)

Inflow = 1.17 cfs @ 12.07 hrs, Volume= 0.087 af
Outflow = 1.14 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 3%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.0 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.9 fps, Avg. Travel Time= 1.7 min

Peak Depth= 0.34'
Capacity at bank full= 4.73 cfs
12.0" Diameter Pipe n= 0.012 Length= 195.0' Slope= 0.0150 '/'

Reach 320.: (new node)

Inflow = 1.14 cfs @ 12.09 hrs, Volume= 0.086 af
Outflow = 1.14 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 19.2 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.3 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.13'
Capacity at bank full= 32.06 cfs
12.0" Diameter Pipe n= 0.012 Length= 56.0' Slope= 0.6900 '/'

Reach 410: (new node)

Inflow = 1.54 cfs @ 12.07 hrs, Volume= 0.114 af
Outflow = 1.51 cfs @ 12.09 hrs, Volume= 0.114 af, Atten= 2%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.6 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.8 fps, Avg. Travel Time= 1.0 min

Peak Depth= 0.44'
Capacity at bank full= 3.86 cfs
12.0" Diameter Pipe n= 0.012 Length= 110.0' Slope= 0.0100 '/'

Reach 420: (new node)

Inflow = 2.13 cfs @ 12.09 hrs, Volume= 0.160 af
Outflow = 2.12 cfs @ 12.09 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.4 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.2 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.30'
Capacity at bank full= 24.14 cfs
18.0" Diameter Pipe n= 0.012 Length= 14.0' Slope= 0.0450 '/'

Reach 610: (new node)

Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.3 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.3 fps, Avg. Travel Time= 1.8 min

Peak Depth= 0.00'
Capacity at bank full= 26.83 cfs
20.00' x 0.25' deep channel, n= 0.050 Length= 28.0' Slope= 0.2139 '/'

Reach 620: (new node)

Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 13%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.1 fps, Min. Travel Time= 33.7 min
Avg. Velocity = 0.1 fps, Avg. Travel Time= 33.7 min

Peak Depth= 0.00'
Capacity at bank full= 0.75 cfs
1.00' x 0.25' deep channel, n= 0.040 Length= 265.0' Slope= 0.0370 '/'
Side Slope Z-value= 3.0 0.0 '/'

Reach 810: (new node)

Inflow = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af
Outflow = 2.53 cfs @ 12.08 hrs, Volume= 0.171 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 15.4 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.6 fps, Avg. Travel Time= 0.5 min

Peak Depth= 0.26'
Capacity at bank full= 16.82 cfs
12.0" Diameter Pipe n= 0.012 Length= 169.0' Slope= 0.1900 '/'

Reach 820: (new node)

Inflow = 2.53 cfs @ 12.08 hrs, Volume= 0.171 af
Outflow = 2.52 cfs @ 12.09 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.3 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.9 fps, Avg. Travel Time= 0.5 min

Peak Depth= 0.29'
Capacity at bank full= 13.70 cfs
12.0" Diameter Pipe n= 0.012 Length= 141.0' Slope= 0.1260 '/'

Reach ESS: (new node)

Inflow = 1.34 cfs @ 12.12 hrs, Volume= 0.100 af
Outflow = 1.33 cfs @ 12.13 hrs, Volume= 0.100 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.5 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.3 fps, Avg. Travel Time= 1.3 min

Peak Depth= 0.31'
Capacity at bank full= 3.10 cfs
8.0" Diameter Pipe n= 0.012 Length= 265.0' Slope= 0.0560 '/'

Pond 1P: (new node)

Inflow = 1.15 cfs @ 12.08 hrs, Volume= 0.076 af
Primary = 1.15 cfs @ 12.08 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2AP: (new node)

Inflow = 3.78 cfs @ 12.08 hrs, Volume= 0.285 af
Primary = 3.78 cfs @ 12.08 hrs, Volume= 0.285 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 2P: (new node)

Inflow = 1.49 cfs @ 12.08 hrs, Volume= 0.100 af
Outflow = 1.34 cfs @ 12.12 hrs, Volume= 0.100 af, Atten= 10%, Lag= 2.8 min
Primary = 1.34 cfs @ 12.12 hrs, Volume= 0.100 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 119.92' Storage= 131 cf
Plug-Flow detention time= 0.7 min calculated for 0.100 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	12	0	0
123.00	12	168	168
124.00	12	12	180

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	109.00'	**4.0" x 113.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 67.75' S= 0.3650 '/' n= 0.012 Cc= 0.900
2	Secondary	123.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.7

Pond 5P: (new node)

Inflow = 7.63 cfs @ 12.07 hrs, Volume= 0.529 af
Primary = 7.63 cfs @ 12.07 hrs, Volume= 0.529 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 6P: (new node)

Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 7P: (new node)

Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af
Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 9P: (new node)

Inflow = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af
Primary = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 10P: (new node)

Inflow = 2.72 cfs @ 12.07 hrs, Volume= 0.189 af
Primary = 2.72 cfs @ 12.07 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 11P: (new node)

Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.047 af
Primary = 0.63 cfs @ 12.07 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 12P: (new node)

Inflow = 1.21 cfs @ 12.07 hrs, Volume= 0.090 af
Primary = 1.21 cfs @ 12.07 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 13P: (new node)

Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 15P: (new node)

Inflow = 0.45 cfs @ 12.08 hrs, Volume= 0.030 af
Primary = 0.45 cfs @ 12.08 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 16P: (new node)

Inflow = 0.12 cfs @ 12.12 hrs, Volume= 0.013 af
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.11 hrs, Volume= 0.013 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 62.30' Storage= 10 cf
Plug-Flow detention time= 5.8 min calculated for 0.013 af (99% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.50	12	0	0
62.00	12	6	6
66.00	12	48	54
67.00	12	12	66

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	62.00'	**4.0" x 21.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 61.79' S= 0.0100 '/' n= 0.012 Cc= 0.900
2	Secondary	65.50'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.7

Pond CB-63: (new node)

Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af
Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond dmh-20: (new node)

Inflow = 11.64 cfs @ 12.12 hrs, Volume= 0.862 af
Primary = 11.64 cfs @ 12.12 hrs, Volume= 0.862 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SMH-13: (new node)

Inflow = 7.65 cfs @ 12.09 hrs, Volume= 0.596 af
Primary = 7.65 cfs @ 12.09 hrs, Volume= 0.596 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SMH-20: (new node)

Inflow = 6.35 cfs @ 12.08 hrs, Volume= 0.483 af
Primary = 6.35 cfs @ 12.08 hrs, Volume= 0.483 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond smh-21: (new node)

Inflow = 3.77 cfs @ 12.08 hrs, Volume= 0.285 af
Primary = 3.77 cfs @ 12.08 hrs, Volume= 0.285 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SMH-26: (new node)

Inflow	=	10.73 cfs @	12.11 hrs,	Volume=	0.783 af
Outflow	=	10.58 cfs @	12.12 hrs,	Volume=	0.783 af, Atten= 1%, Lag= 0.5 min
Primary	=	10.58 cfs @	12.12 hrs,	Volume=	0.783 af
Secondary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 52.46' Storage= 102 cf
Plug-Flow detention time= 0.2 min calculated for 0.783 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.00	12	0	0
53.42	12	113	113
55.00	12	19	132

Primary OutFlow (Free Discharge)
└─1=Culvert

Secondary OutFlow (Free Discharge)
└─2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	44.20'	**12.0" x 209.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 31.99' S= 0.0584 '/' n= 0.012 Cc= 0.900
2	Secondary	53.40'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.7

Pond SMH12: (new node)

Inflow	=	1.34 cfs @	12.12 hrs,	Volume=	0.100 af
Primary	=	1.34 cfs @	12.12 hrs,	Volume=	0.100 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-1: (new node)

Inflow	=	1.15 cfs @	12.08 hrs,	Volume=	0.076 af
Primary	=	1.15 cfs @	12.08 hrs,	Volume=	0.076 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond sp-2: (new node)

Inflow = 18.67 cfs @ 12.12 hrs, Volume= 1.490 af
Primary = 18.67 cfs @ 12.12 hrs, Volume= 1.490 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond sp-3: (new node)

Inflow = 11.64 cfs @ 12.12 hrs, Volume= 0.862 af
Primary = 11.64 cfs @ 12.12 hrs, Volume= 0.862 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond sp-4: (new node)

Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af
Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-5: (new node)

Inflow = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af
Primary = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-6: (new node)

Inflow = 2.72 cfs @ 12.07 hrs, Volume= 0.189 af
Primary = 2.72 cfs @ 12.07 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-7: (new node)

Inflow = 0.45 cfs @ 12.08 hrs, Volume= 0.030 af
Primary = 0.45 cfs @ 12.08 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond tank: (new node)

Inflow = 11.18 cfs @ 12.08 hrs, Volume= 0.787 af
Outflow = 10.73 cfs @ 12.11 hrs, Volume= 0.783 af, Atten= 4%, Lag= 2.1 min
Primary = 10.73 cfs @ 12.11 hrs, Volume= 0.783 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 69.50' Storage= 1,461 cf
Plug-Flow detention time= 5.1 min calculated for 0.783 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
63.00	225	0	0
72.00	225	2,025	2,025
73.00	225	225	2,250

Primary OutFlow (Free Discharge)
1=Culvert
2=Orifice/Grate

Secondary OutFlow (Free Discharge)
3=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	63.50'	**12.0" x 168.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 44.97' S= 0.1103 '/' n= 0.012 Cc= 0.900
2	Primary	68.00'	**8.0" Vert. Orifice/Grate** C= 0.600
3	Secondary	72.00'	**4.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.7

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=4.70"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=88 Area=0.539 ac Runoff= 2.11 cfs 0.143 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.576 ac Runoff= 2.66 cfs 0.199 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=89 Area=0.672 ac Runoff= 2.69 cfs 0.184 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=98 Area=0.401 ac Runoff= 1.85 cfs 0.139 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 2.44 cfs 0.182 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=94 Area=2.860 ac Runoff= 12.64 cfs 0.903 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=43 Area=0.250 ac Runoff= 0.02 cfs 0.005 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 2.98 cfs 0.210 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 4.61 cfs 0.315 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 8.66 cfs 0.607 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=86 Area=0.767 ac Runoff= 2.85 cfs 0.192 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.216 ac Runoff= 1.00 cfs 0.075 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.415 ac Runoff= 1.92 cfs 0.143 af

Subcatchment 13S: (new node)
Tc=5.0 min CN=43 Area=0.210 ac Runoff= 0.02 cfs 0.004 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=71 Area=1.390 ac Runoff= 3.04 cfs 0.202 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=84 Area=0.254 ac Runoff= 0.89 cfs 0.060 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=61 Area=0.506 ac Runoff= 0.64 cfs 0.045 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 4.25 cfs 0.317 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 20.76 cfs 1.651 af

Reach 110: (new node)
Inflow= 1.00 cfs 0.075 af
Length= 60.0' Max Vel= 4.1 fps Capacity= 3.86 cfs Outflow= 0.98 cfs 0.075 af

Reach 115: (new node)
Inflow= 0.98 cfs 0.075 af
Length= 50.0' Max Vel= 4.1 fps Capacity= 3.86 cfs Outflow= 0.98 cfs 0.075 af

Reach 120: (new node)
Length= 55.0' Max Vel= 0.0 fps Capacity= 5.65 cfs Outflow= 0.00 cfs 0.000 af

Reach 125: (new node)
Inflow= 0.00 cfs 0.000 af
Length= 172.0' Max Vel= 0.0 fps Capacity= 0.92 cfs Outflow= 0.00 cfs 0.000 af

Reach 131: (new node)
Inflow= 0.02 cfs 0.004 af
Length= 30.0' Max Vel= 1.5 fps Capacity= 0.21 cfs Outflow= 0.02 cfs 0.004 af

Reach 165: (new node)
Inflow= 0.60 cfs 0.049 af
Length= 215.0' Max Vel= 6.7 fps Capacity= 3.01 cfs Outflow= 0.59 cfs 0.049 af

Reach 171: (new node)
Inflow= 4.25 cfs 0.317 af
Length= 31.0' Max Vel= 16.9 fps Capacity= 29.32 cfs Outflow= 4.24 cfs 0.317 af

Reach 172: (new node)
Inflow= 10.07 cfs 0.773 af
Length= 32.0' Max Vel= 21.3 fps Capacity= 28.85 cfs Outflow= 10.07 cfs 0.773 af

Reach 210A: (new node)
Inflow= 5.98 cfs 0.456 af
Length= 150.0' Max Vel= 23.2 fps Capacity= 39.83 cfs Outflow= 5.97 cfs 0.456 af

Reach 220A: (new node)
Inflow= 5.97 cfs 0.456 af
Length= 168.0' Max Vel= 10.7 fps Capacity= 13.64 cfs Outflow= 5.92 cfs 0.456 af

Reach 310: (new node)
Inflow= 1.85 cfs 0.139 af
Length= 195.0' Max Vel= 5.6 fps Capacity= 4.73 cfs Outflow= 1.80 cfs 0.138 af

Reach 320.: (new node)
Inflow= 1.80 cfs 0.138 af
Length= 56.0' Max Vel= 22.0 fps Capacity= 32.06 cfs Outflow= 1.80 cfs 0.138 af

Reach 410: (new node) Inflow= 2.44 cfs 0.182 af
Length= 110.0' Max Vel= 5.2 fps Capacity= 3.86 cfs Outflow= 2.39 cfs 0.182 af

Reach 420: (new node) Inflow= 3.37 cfs 0.257 af
Length= 14.0' Max Vel= 9.6 fps Capacity= 24.14 cfs Outflow= 3.36 cfs 0.257 af

Reach 610: (new node) Inflow= 0.02 cfs 0.005 af
Length= 28.0' Max Vel= 0.3 fps Capacity= 26.83 cfs Outflow= 0.02 cfs 0.005 af

Reach 620: (new node) Inflow= 0.02 cfs 0.005 af
Length= 265.0' Max Vel= 0.6 fps Capacity= 0.75 cfs Outflow= 0.02 cfs 0.005 af

Reach 810: (new node) Inflow= 4.61 cfs 0.315 af
Length= 169.0' Max Vel= 18.1 fps Capacity= 16.82 cfs Outflow= 4.55 cfs 0.315 af

Reach 820: (new node) Inflow= 4.55 cfs 0.315 af
Length= 141.0' Max Vel= 15.6 fps Capacity= 13.70 cfs Outflow= 4.53 cfs 0.315 af

Reach ESS: (new node) Inflow= 2.85 cfs 0.184 af
Length= 265.0' Max Vel= 10.0 fps Capacity= 3.10 cfs Outflow= 2.63 cfs 0.184 af

Pond 1P: (new node) Inflow= 2.11 cfs 0.143 af
Primary= 2.11 cfs 0.143 af

Pond 2AP: (new node) Inflow= 5.98 cfs 0.456 af
Primary= 5.98 cfs 0.456 af

Pond 2P: (new node) Peak Storage= 171 cf Inflow= 2.69 cfs 0.184 af
Primary= 1.36 cfs 0.171 af Secondary= 1.49 cfs 0.013 af Outflow= 2.85 cfs 0.184 af

Pond 5P: (new node) Inflow= 12.64 cfs 0.903 af
Primary= 12.64 cfs 0.903 af

Pond 6P: (new node) Inflow= 0.02 cfs 0.005 af
Primary= 0.02 cfs 0.005 af

Pond 7P: (new node) Inflow= 2.98 cfs 0.210 af
Primary= 2.98 cfs 0.210 af

Pond 9P: (new node) Inflow= 8.66 cfs 0.607 af
Primary= 8.66 cfs 0.607 af

Pond 10P: (new node) Inflow= 4.77 cfs 0.335 af
Primary= 4.77 cfs 0.335 af

Pond 11P: (new node) Inflow= 1.00 cfs 0.075 af
Primary= 1.00 cfs 0.075 af

Pond 12P: (new node) Inflow= 1.92 cfs 0.143 af
Primary= 1.92 cfs 0.143 af

Pond 13P: (new node) Inflow= 0.02 cfs 0.004 af
Primary= 0.02 cfs 0.004 af

Pond 15P: (new node) Inflow= 0.89 cfs 0.060 af
Primary= 0.89 cfs 0.060 af

Pond 16P: (new node) Peak Storage= 42 cf Inflow= 0.64 cfs 0.049 af
Primary= 0.60 cfs 0.049 af Secondary= 0.00 cfs 0.000 af Outflow= 0.60 cfs 0.049 af

Pond CB-63: (new node) Inflow= 2.98 cfs 0.210 af
Primary= 2.98 cfs 0.210 af

Pond dmh-20: (new node) Inflow= 23.60 cfs 1.559 af
Primary= 23.60 cfs 1.559 af

Pond SMH-13: (new node) Inflow= 13.22 cfs 1.006 af
Primary= 13.22 cfs 1.006 af

Pond SMH-20: (new node) Inflow= 10.07 cfs 0.773 af
Primary= 10.07 cfs 0.773 af

Pond smh-21: (new node) Inflow= 5.97 cfs 0.456 af
Primary= 5.97 cfs 0.456 af

Pond SMH-26: (new node) Peak Storage= 124 cf Inflow= 20.78 cfs 1.352 af
Primary= 10.93 cfs 1.280 af Secondary= 9.67 cfs 0.072 af Outflow= 20.60 cfs 1.352 af

Pond SMH12: (new node) Inflow= 2.85 cfs 0.184 af
Primary= 2.85 cfs 0.184 af

Pond SP-1: (new node) Inflow= 2.11 cfs 0.143 af
Primary= 2.11 cfs 0.143 af

Pond sp-2: (new node) Inflow= 32.95 cfs 2.657 af
Primary= 32.95 cfs 2.657 af

Pond sp-3: (new node) Inflow= 23.60 cfs 1.559 af
Primary= 23.60 cfs 1.559 af

Pond sp-4: (new node) Inflow= 2.98 cfs 0.210 af
Primary= 2.98 cfs 0.210 af

Pond SP-5: (new node) Inflow= 8.66 cfs 0.607 af
Primary= 8.66 cfs 0.607 af

Pond SP-6: (new node)
Inflow= 4.77 cfs 0.335 af
Primary= 4.77 cfs 0.335 af

Pond SP-7: (new node)
Inflow= 0.89 cfs 0.060 af
Primary= 0.89 cfs 0.060 af

Pond tank: (new node) Peak Storage= 2,181 cf Inflow= 18.80 cfs 1.356 af
Primary= 14.66 cfs 1.327 af Secondary= 6.13 cfs 0.025 af Outflow= 20.78 cfs 1.352 af

Runoff Area = 21.928 ac Volume = 5.576 af Average Depth = 3.05"

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=5.50"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=88 Area=0.539 ac Runoff= 2.56 cfs 0.176 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.576 ac Runoff= 3.12 cfs 0.234 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=89 Area=0.672 ac Runoff= 3.25 cfs 0.225 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=98 Area=0.401 ac Runoff= 2.17 cfs 0.163 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 2.86 cfs 0.214 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=94 Area=2.860 ac Runoff= 14.97 cfs 1.079 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=43 Area=0.250 ac Runoff= 0.06 cfs 0.009 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 4.34 cfs 0.296 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 5.57 cfs 0.385 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 10.34 cfs 0.732 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=86 Area=0.767 ac Runoff= 3.49 cfs 0.237 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.216 ac Runoff= 1.17 cfs 0.088 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.415 ac Runoff= 2.25 cfs 0.169 af

Subcatchment 13S: (new node)
Tc=5.0 min CN=43 Area=0.210 ac Runoff= 0.05 cfs 0.008 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=71 Area=1.390 ac Runoff= 4.06 cfs 0.268 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=84 Area=0.254 ac Runoff= 1.10 cfs 0.074 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=61 Area=0.506 ac Runoff= 0.94 cfs 0.064 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 4.98 cfs 0.373 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 25.09 cfs 2.017 af

Reach 110: (new node)
Inflow= 1.17 cfs 0.088 af
Length= 60.0' Max Vel= 4.3 fps Capacity= 3.86 cfs Outflow= 1.15 cfs 0.088 af

Reach 115: (new node)
Inflow= 1.15 cfs 0.088 af
Length= 50.0' Max Vel= 4.3 fps Capacity= 3.86 cfs Outflow= 1.14 cfs 0.088 af

Reach 120: (new node)
Length= 55.0' Max Vel= 0.0 fps Capacity= 5.65 cfs Outflow= 0.00 cfs 0.000 af

Reach 125: (new node)
Inflow= 0.00 cfs 0.000 af
Length= 172.0' Max Vel= 0.0 fps Capacity= 0.92 cfs Outflow= 0.00 cfs 0.000 af

Reach 131: (new node)
Inflow= 0.05 cfs 0.008 af
Length= 30.0' Max Vel= 1.9 fps Capacity= 0.21 cfs Outflow= 0.05 cfs 0.008 af

Reach 165: (new node)
Inflow= 1.10 cfs 0.072 af
Length= 215.0' Max Vel= 7.9 fps Capacity= 3.01 cfs Outflow= 1.00 cfs 0.072 af

Reach 171: (new node)
Inflow= 4.98 cfs 0.373 af
Length= 31.0' Max Vel= 17.7 fps Capacity= 29.32 cfs Outflow= 4.97 cfs 0.373 af

Reach 172: (new node)
Inflow= 11.82 cfs 0.908 af
Length= 32.0' Max Vel= 22.3 fps Capacity= 28.85 cfs Outflow= 11.81 cfs 0.908 af

Reach 210A: (new node)
Inflow= 7.02 cfs 0.536 af
Length= 150.0' Max Vel= 24.3 fps Capacity= 39.83 cfs Outflow= 7.00 cfs 0.536 af

Reach 220A: (new node)
Inflow= 7.00 cfs 0.536 af
Length= 168.0' Max Vel= 11.2 fps Capacity= 13.64 cfs Outflow= 6.95 cfs 0.536 af

Reach 310: (new node)
Inflow= 2.17 cfs 0.163 af
Length= 195.0' Max Vel= 5.9 fps Capacity= 4.73 cfs Outflow= 2.11 cfs 0.163 af

Reach 320.: (new node)
Inflow= 2.11 cfs 0.163 af
Length= 56.0' Max Vel= 23.1 fps Capacity= 32.06 cfs Outflow= 2.11 cfs 0.163 af

Reach 410: (new node) Inflow= 2.86 cfs 0.214 af
Length= 110.0' Max Vel= 5.3 fps Capacity= 3.86 cfs Outflow= 2.80 cfs 0.214 af

Reach 420: (new node) Inflow= 3.95 cfs 0.302 af
Length= 14.0' Max Vel= 10.0 fps Capacity= 24.14 cfs Outflow= 3.95 cfs 0.302 af

Reach 610: (new node) Inflow= 0.06 cfs 0.009 af
Length= 28.0' Max Vel= 0.5 fps Capacity= 26.83 cfs Outflow= 0.06 cfs 0.009 af

Reach 620: (new node) Inflow= 0.06 cfs 0.009 af
Length= 265.0' Max Vel= 0.9 fps Capacity= 0.75 cfs Outflow= 0.06 cfs 0.009 af

Reach 810: (new node) Inflow= 5.57 cfs 0.385 af
Length= 169.0' Max Vel= 19.0 fps Capacity= 16.82 cfs Outflow= 5.50 cfs 0.385 af

Reach 820: (new node) Inflow= 5.50 cfs 0.385 af
Length= 141.0' Max Vel= 16.4 fps Capacity= 13.70 cfs Outflow= 5.47 cfs 0.385 af

Reach ESS: (new node) Inflow= 3.53 cfs 0.225 af
Length= 265.0' Max Vel= 10.1 fps Capacity= 3.10 cfs Outflow= 3.15 cfs 0.225 af

Pond 1P: (new node) Inflow= 2.56 cfs 0.176 af
Primary= 2.56 cfs 0.176 af

Pond 2AP: (new node) Inflow= 7.02 cfs 0.536 af
Primary= 7.02 cfs 0.536 af

Pond 2P: (new node) Peak Storage= 172 cf Inflow= 3.25 cfs 0.225 af
Primary= 1.36 cfs 0.202 af Secondary= 2.17 cfs 0.023 af Outflow= 3.53 cfs 0.225 af

Pond 5P: (new node) Inflow= 14.97 cfs 1.079 af
Primary= 14.97 cfs 1.079 af

Pond 6P: (new node) Inflow= 0.06 cfs 0.009 af
Primary= 0.06 cfs 0.009 af

Pond 7P: (new node) Inflow= 4.34 cfs 0.296 af
Primary= 4.34 cfs 0.296 af

Pond 9P: (new node) Inflow= 10.34 cfs 0.732 af
Primary= 10.34 cfs 0.732 af

Pond 10P: (new node) Inflow= 5.74 cfs 0.406 af
Primary= 5.74 cfs 0.406 af

Pond 11P: (new node) Inflow= 1.17 cfs 0.088 af
Primary= 1.17 cfs 0.088 af

Pond 12P: (new node) Inflow= 2.25 cfs 0.169 af
Primary= 2.25 cfs 0.169 af

Pond 13P: (new node) Inflow= 0.05 cfs 0.008 af
Primary= 0.05 cfs 0.008 af

Pond 15P: (new node) Inflow= 1.10 cfs 0.074 af
Primary= 1.10 cfs 0.074 af

Pond 16P: (new node) Peak Storage= 50 cf Inflow= 0.97 cfs 0.072 af
Primary= 0.66 cfs 0.069 af Secondary= 0.44 cfs 0.002 af Outflow= 1.10 cfs 0.072 af

Pond CB-63: (new node) Inflow= 4.34 cfs 0.296 af
Primary= 4.34 cfs 0.296 af

Pond dmh-20: (new node) Inflow= 27.22 cfs 1.899 af
Primary= 27.22 cfs 1.899 af

Pond SMH-13: (new node) Inflow= 15.90 cfs 1.205 af
Primary= 15.90 cfs 1.205 af

Pond SMH-20: (new node) Inflow= 11.82 cfs 0.908 af
Primary= 11.82 cfs 0.908 af

Pond smh-21: (new node) Inflow= 7.00 cfs 0.536 af
Primary= 7.00 cfs 0.536 af

Pond SMH-26: (new node) Peak Storage= 126 cf Inflow= 23.27 cfs 1.622 af
Primary= 10.98 cfs 1.493 af Secondary= 12.21 cfs 0.129 af Outflow= 23.19 cfs 1.622 af

Pond SMH12: (new node) Inflow= 3.53 cfs 0.225 af
Primary= 3.53 cfs 0.225 af

Pond SP-1: (new node) Inflow= 2.56 cfs 0.176 af
Primary= 2.56 cfs 0.176 af

Pond sp-2: (new node) Inflow= 39.74 cfs 3.222 af
Primary= 39.74 cfs 3.222 af

Pond sp-3: (new node) Inflow= 27.22 cfs 1.899 af
Primary= 27.22 cfs 1.899 af

Pond sp-4: (new node) Inflow= 4.34 cfs 0.296 af
Primary= 4.34 cfs 0.296 af

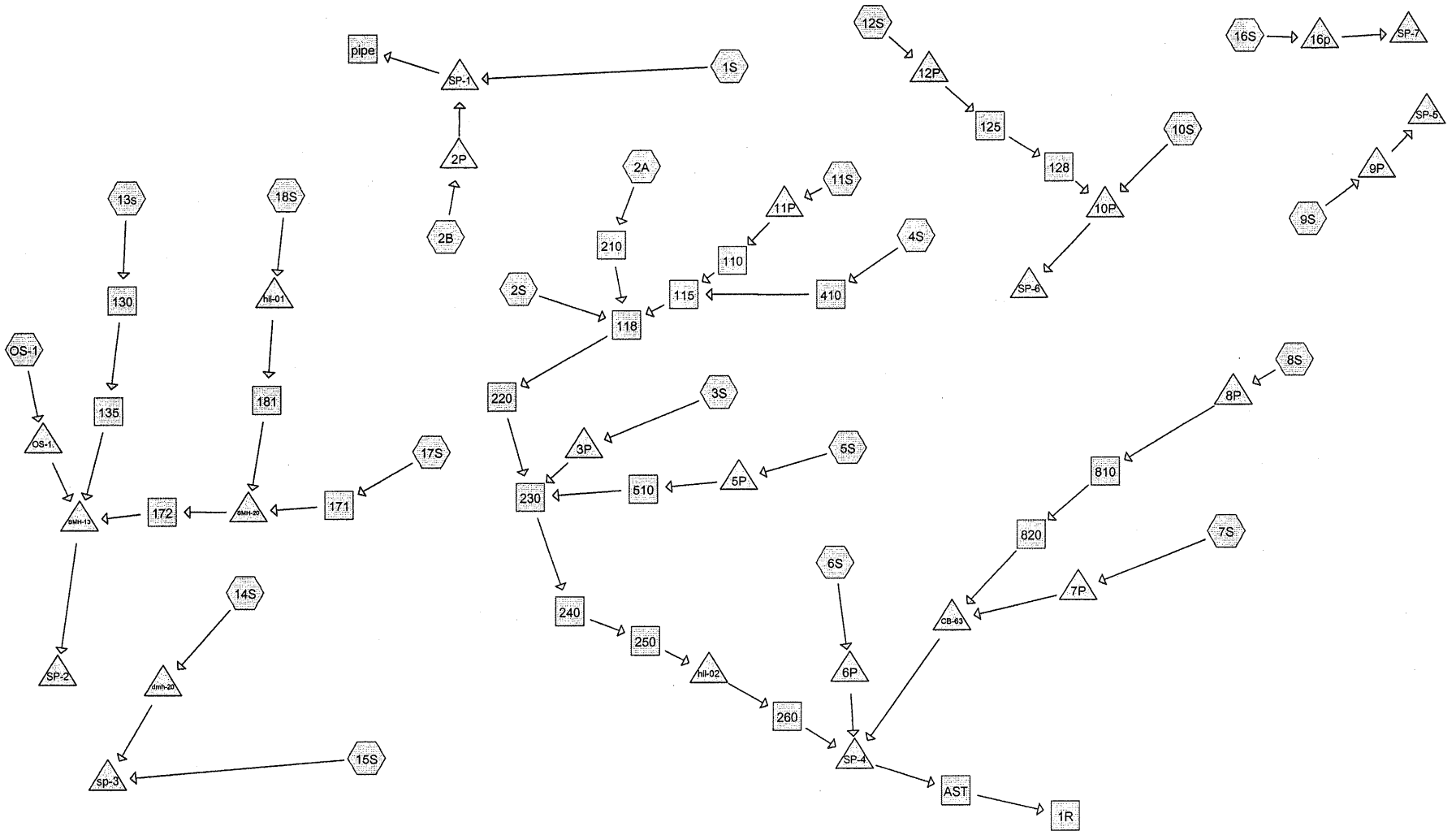
Pond SP-5: (new node) Inflow= 10.34 cfs 0.732 af
Primary= 10.34 cfs 0.732 af

Pond SP-6: (new node)
Inflow= 5.74 cfs 0.406 af
Primary= 5.74 cfs 0.406 af

Pond SP-7: (new node)
Inflow= 1.10 cfs 0.074 af
Primary= 1.10 cfs 0.074 af

Pond tank: (new node) Peak Storage= 2,218 cf Inflow= 22.36 cfs 1.626 af
Primary= 14.83 cfs 1.560 af Secondary= 8.44 cfs 0.063 af Outflow= 23.27 cfs 1.622 af

Runoff Area = 21.928 ac Volume = 6.810 af Average Depth = 3.73"



Subcat Reach Pond Link

Drainage Diagram for 01046-post

Prepared by {enter your company name here} 12/23/03

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=3.00"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=84 Area=0.448 ac Runoff= 0.80 cfs 0.053 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.568 ac Runoff= 1.66 cfs 0.123 af

Subcatchment 2B: (new node)
Tc=5.0 min CN=80 Area=0.320 ac Runoff= 0.46 cfs 0.031 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=98 Area=0.384 ac Runoff= 1.12 cfs 0.083 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=89 Area=0.347 ac Runoff= 0.77 cfs 0.052 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 1.54 cfs 0.114 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=91 Area=2.860 ac Runoff= 6.89 cfs 0.465 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=91 Area=0.251 ac Runoff= 0.60 cfs 0.041 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 0.64 cfs 0.064 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 2.55 cfs 0.171 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 5.07 cfs 0.345 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=87 Area=0.853 ac Runoff= 1.74 cfs 0.116 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.249 ac Runoff= 0.73 cfs 0.054 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.533 ac Runoff= 1.56 cfs 0.115 af

Subcatchment 13s: (new node)
Tc=6.2 min CN=78 Area=0.146 ac Runoff= 0.18 cfs 0.013 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=76 Area=1.140 ac Runoff= 1.30 cfs 0.088 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=43 Area=0.241 ac Runoff= 0.00 cfs 0.000 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=98 Area=0.093 ac Runoff= 0.27 cfs 0.020 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 2.69 cfs 0.198 af

Subcatchment 18S: (new node)
Tc=5.0 min CN=98 Area=0.623 ac Runoff= 1.82 cfs 0.134 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 11.55 cfs 0.894 af

Reach 1R: (new node)
Inflow= 15.90 cfs 1.164 af
Length= 10.0' Max Vel= 7.7 fps Capacity= 22.37 cfs Outflow= 15.88 cfs 1.164 af

Reach 110: (new node)
Inflow= 0.73 cfs 0.054 af
Length= 51.0' Max Vel= 3.8 fps Capacity= 1.31 cfs Outflow= 0.72 cfs 0.054 af

Reach 115: (new node)
Inflow= 2.24 cfs 0.168 af
Length= 83.0' Max Vel= 5.1 fps Capacity= 7.00 cfs Outflow= 2.22 cfs 0.168 af

Reach 118: (new node)
Inflow= 4.93 cfs 0.373 af
Length= 66.0' Max Vel= 5.9 fps Capacity= 10.76 cfs Outflow= 4.90 cfs 0.373 af

Reach 125: (new node)
Inflow= 1.56 cfs 0.115 af
Length= 113.0' Max Vel= 6.0 fps Capacity= 5.59 cfs Outflow= 1.53 cfs 0.115 af

Reach 128: (new node)
Inflow= 1.53 cfs 0.115 af
Length= 71.0' Max Vel= 3.5 fps Capacity= 2.71 cfs Outflow= 1.51 cfs 0.115 af

Reach 130: (new node)
Inflow= 0.18 cfs 0.013 af
Length= 74.0' Max Vel= 4.2 fps Capacity= 7.91 cfs Outflow= 0.18 cfs 0.013 af

Reach 135: (new node)
Inflow= 0.18 cfs 0.013 af
Length= 225.0' Max Vel= 4.8 fps Capacity= 3.10 cfs Outflow= 0.17 cfs 0.013 af

Reach 171: (new node)
Inflow= 2.69 cfs 0.198 af
Length= 31.0' Max Vel= 14.8 fps Capacity= 29.32 cfs Outflow= 2.68 cfs 0.198 af

Reach 172: (new node)
Inflow= 4.46 cfs 0.333 af
Length= 32.0' Max Vel= 16.9 fps Capacity= 28.85 cfs Outflow= 4.44 cfs 0.332 af

Reach 181: (new node) Inflow= 1.82 cfs 0.134 af
Length= 125.0' Max Vel= 7.7 fps Capacity= 13.83 cfs Outflow= 1.79 cfs 0.134 af

Reach 210: (new node) Inflow= 1.66 cfs 0.123 af
Length= 147.0' Max Vel= 4.1 fps Capacity= 3.23 cfs Outflow= 1.61 cfs 0.122 af

Reach 220: (new node) Inflow= 4.90 cfs 0.373 af
Length= 218.0' Max Vel= 11.4 fps Capacity= 26.19 cfs Outflow= 4.85 cfs 0.373 af

Reach 230: (new node) Inflow= 12.36 cfs 0.889 af
Length= 71.0' Max Vel= 25.9 fps Capacity= 57.69 cfs Outflow= 12.35 cfs 0.889 af

Reach 240: (new node) Inflow= 12.35 cfs 0.889 af
Length= 69.0' Max Vel= 22.9 fps Capacity= 48.44 cfs Outflow= 12.33 cfs 0.889 af

Reach 250: (new node) Inflow= 12.33 cfs 0.889 af
Length= 36.0' Max Vel= 11.9 fps Capacity= 43.43 cfs Outflow= 12.32 cfs 0.889 af

Reach 260: (new node) Inflow= 12.32 cfs 0.889 af
Length= 39.0' Max Vel= 7.5 fps Capacity= 23.22 cfs Outflow= 12.29 cfs 0.889 af

Reach 410: (new node) Inflow= 1.54 cfs 0.114 af
Length= 35.0' Max Vel= 3.6 fps Capacity= 2.77 cfs Outflow= 1.52 cfs 0.114 af

Reach 510: (new node) Inflow= 6.89 cfs 0.465 af
Length= 23.0' Max Vel= 26.2 fps Capacity= 74.96 cfs Outflow= 6.88 cfs 0.465 af

Reach 810: (new node) Inflow= 2.55 cfs 0.171 af
Length= 200.0' Max Vel= 14.5 fps Capacity= 15.48 cfs Outflow= 2.53 cfs 0.171 af

Reach 820: (new node) Inflow= 2.53 cfs 0.171 af
Length= 192.0' Max Vel= 12.2 fps Capacity= 12.21 cfs Outflow= 2.51 cfs 0.171 af

Reach AST: (new node) Inflow= 15.99 cfs 1.164 af
Length= 214.0' Max Vel= 19.8 fps Capacity= 22.39 cfs Outflow= 15.90 cfs 1.164 af

Reach pipe: (new node) Inflow= 1.26 cfs 0.083 af
Length= 10.0' Max Vel= 5.6 fps Capacity= 5.46 cfs Outflow= 1.26 cfs 0.083 af

Pond 2P: (new node) Peak Storage= 4 cf Inflow= 0.46 cfs 0.031 af
Primary= 0.46 cfs 0.031 af Outflow= 0.46 cfs 0.031 af

Pond 3P: (new node) Inflow= 0.77 cfs 0.052 af
Primary= 0.77 cfs 0.052 af

Pond 5P: (new node) Inflow= 6.89 cfs 0.465 af
Primary= 6.89 cfs 0.465 af

Pond 6P: (new node) Inflow= 0.60 cfs 0.041 af
Primary= 0.60 cfs 0.041 af

Pond 7P: (new node) Inflow= 0.64 cfs 0.064 af
Primary= 0.64 cfs 0.064 af

Pond 8P: (new node) Inflow= 2.55 cfs 0.171 af
Primary= 2.55 cfs 0.171 af

Pond 9P: (new node) Inflow= 5.07 cfs 0.345 af
Primary= 5.07 cfs 0.345 af

Pond 10P: (new node) Inflow= 3.24 cfs 0.230 af
Primary= 3.24 cfs 0.230 af

Pond 11P: (new node) Inflow= 0.73 cfs 0.054 af
Primary= 0.73 cfs 0.054 af

Pond 12P: (new node) Inflow= 1.56 cfs 0.115 af
Primary= 1.56 cfs 0.115 af

Pond 16p: (new node) Inflow= 0.27 cfs 0.020 af
Primary= 0.27 cfs 0.020 af

Pond CB-63: (new node) Peak Storage= 15 cf Inflow= 3.13 cfs 0.235 af
Primary= 3.13 cfs 0.235 af Outflow= 3.13 cfs 0.235 af

Pond dmh-20: (new node) Inflow= 1.30 cfs 0.088 af
Primary= 1.30 cfs 0.088 af

Pond hil-01: (new node) Inflow= 1.82 cfs 0.134 af
Primary= 1.82 cfs 0.134 af

Pond hil-02: (new node) Inflow= 12.32 cfs 0.889 af
Primary= 12.32 cfs 0.889 af

Pond OS-1.: (new node) Inflow= 11.55 cfs 0.894 af
Primary= 11.55 cfs 0.894 af

Pond SMH-13: (new node) Inflow= 15.49 cfs 1.239 af
Primary= 15.49 cfs 1.239 af

Pond SMH-20: (new node) Inflow= 4.46 cfs 0.333 af
Primary= 4.46 cfs 0.333 af

Pond SP-1: (new node) Inflow= 1.26 cfs 0.083 af
Primary= 1.26 cfs 0.083 af

Pond SP-2: (new node)
Inflow= 15.49 cfs 1.239 af
Primary= 15.49 cfs 1.239 af

Pond sp-3: (new node)
Inflow= 1.30 cfs 0.088 af
Primary= 1.30 cfs 0.088 af

Pond SP-4: (new node)
Inflow= 15.99 cfs 1.164 af
Primary= 15.99 cfs 1.164 af

Pond SP-5: (new node)
Inflow= 5.07 cfs 0.345 af
Primary= 5.07 cfs 0.345 af

Pond SP-6: (new node)
Inflow= 3.24 cfs 0.230 af
Primary= 3.24 cfs 0.230 af

Pond SP-7: (new node)
Inflow= 0.27 cfs 0.020 af
Primary= 0.27 cfs 0.020 af

Runoff Area = 21.928 ac Volume = 3.171 af Average Depth = 1.74"

Subcatchment 1S: (new node)

Runoff = 0.80 cfs @ 12.08 hrs, Volume= 0.053 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.344	98	Paved parking & roofs
0.104	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.2		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.4		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.2		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	11.0	8.63	**Circular Channel (pipe), PIPE D TO E** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
1.0					**Direct Entry, DIRECT**
5.0	229	Total			

Subcatchment 2A: (new node)

Runoff = 1.66 cfs @ 12.07 hrs, Volume= 0.123 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.568	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.9					**Direct Entry, DIRECT**
5.0	142	Total			

Subcatchment 2B: (new node)

Runoff = 0.46 cfs @ 12.08 hrs, Volume= 0.031 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.220	98	Paved parking & roofs
0.100	39	>75% Grass cover, Good, HSG A
0.320	80	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	4.0		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.1	0.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
1.9					**Direct Entry, DIRECT**
5.0	284	Total			

Subcatchment 2S: (new node)

Runoff = 1.12 cfs @ 12.07 hrs, Volume= 0.083 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.384	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.0		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.9		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.1	3.99	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
5.0	244	Total			

Subcatchment 3S: (new node)

Runoff = 0.77 cfs @ 12.08 hrs, Volume= 0.052 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.054	39	>75% Grass cover, Good, HSG A
0.293	98	Paved parking & roofs
0.347	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.1		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	106	0.0810	5.8		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.2	222	0.0530	14.8	26.20	**Circular Channel (pipe), PIPE C TO D** Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
4.1					**Direct Entry, DIRECT**
5.0	358	Total			

Subcatchment 4S: (new node)

Runoff = 1.54 cfs @ 12.07 hrs, Volume= 0.114 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.528	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.7		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.4					**Direct Entry, DIRECT**
5.0	160	Total			

Subcatchment 5S: (new node)

Runoff = 6.89 cfs @ 12.07 hrs, Volume= 0.465 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
2.506	98	Paved parking & roofs
0.354	39	>75% Grass cover, Good, HSG A
2.860	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.7	0.93	**Circular Channel (pipe), PIPE B TO C** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.5	6.69	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.2	4.88	**Circular Channel (pipe), PIPE D TO E** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
1.6					**Direct Entry, DIRECT**
5.0	510	Total			

Subcatchment 6S: (new node)

Runoff = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.049	61	>75% Grass cover, Good, HSG B
0.202	98	Paved parking & roofs
0.251	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.8	1.31	**Circular Channel (pipe), PIPE B TO C (ROOF DRAIN)** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.2	3.56	**Circular Channel (pipe), PIPE C TO D** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
4.1					**Direct Entry, DIRECT**
5.0	121	Total			

Subcatchment 7S: (new node)

Runoff = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.456	98	Paved roads w/curbs & sewers
1.354	43	Woods/grass comb., Fair, HSG A
0.079	43	Woods/grass comb., Fair, HSG A
0.327	98	Paved roads w/curbs & sewers
2.216	62	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.7		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.7		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.9		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.3		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.7	12.33	**Circular Channel (pipe), PIPE E TO F** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
5.0	634	Total			

Subcatchment 8S: (new node)

Runoff = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.973	98	Paved parking & roofs
0.152	43	Woods/grass comb., Fair, HSG A
0.025	39	>75% Grass cover, Good, HSG A
1.150	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE B TO C** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE D TO E** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.8					**Direct Entry, DIRECT**
5.0	399	Total			

Subcatchment 9S: (new node)

Runoff = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.191	39	>75% Grass cover, Good, HSG A
1.839	98	Paved parking & roofs
2.030	92	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	285	0.0100	3.8	1.31	**Circular Channel (pipe), PIPE B TO C** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.3	97	0.0100	4.9	3.86	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.4					**Direct Entry, DIRECT**
5.0	422	Total			

Subcatchment 10S: (new node)

Runoff = 1.74 cfs @ 12.08 hrs, Volume= 0.116 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.157	39	>75% Grass cover, Good, HSG A
0.696	98	Paved parking & roofs
0.853	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.4		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.7		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.9		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.1	5.59	**Circular Channel (pipe), PIPE D TO E** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.5	2.73	**Circular Channel (pipe), PIPE E TO F** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.5					**Direct Entry, DIRECT**
5.0	326	Total			

Subcatchment 11S: (new node)

Runoff = 0.73 cfs @ 12.07 hrs, Volume= 0.054 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.249	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.5					**Direct Entry, DIRECT**
5.0	90	Total			

Subcatchment 12S: (new node)

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.115 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.533	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.6		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.4		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.8	1.31	**Circular Channel (pipe), PIPE C TO D** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
2.9					**Direct Entry, DIRECT**
5.0	200	Total			

Subcatchment 13s: (new node)

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.013 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.093	98	Paved parking & roofs
0.053	43	Woods/grass comb., Fair, HSG A
0.146	78	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.1		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.0		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.2		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Subcatchment 14S: (new node)

Runoff = 1.30 cfs @ 12.09 hrs, Volume= 0.088 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.711	98	Paved parking & roofs
0.429	39	>75% Grass cover, Good, HSG A
1.140	76	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	45	0.0680	0.2		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
1.0	217	0.0320	3.6		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7					**Direct Entry, DIRECT**
5.0	262	Total			

Subcatchment 15S: (new node)

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.225	39	>75% Grass cover, Good, HSG A
0.016	98	Paved parking & roofs
0.241	43	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.3		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.5	190	0.1920	6.6		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.5	176	0.0760	5.6		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
3.1					**Direct Entry, DIRECT**
5.0	384	Total			

Subcatchment 16S: (new node)

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.093	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.2	28	0.0100	2.0		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.0	11	0.0125	5.5	4.32	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.2					**Direct Entry, DIRECT**
5.0	69	Total			

Subcatchment 17S: (new node)

Runoff = 2.69 cfs @ 12.07 hrs, Volume= 0.198 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.918	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.0		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.0	5.24	**Circular Channel (pipe), PIPE C TO D** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
4.0					**Direct Entry, DIRECT**
5.0	188	Total			

Subcatchment 18S: (new node)

Runoff = 1.82 cfs @ 12.07 hrs, Volume= 0.134 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
0.623	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.8		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.1		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	135	0.0110	5.2	4.05	**Circular Channel (pipe), PIPE C TO D** Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.5					**Direct Entry, DIRECT**
5.0	316	Total			

Subcatchment OS-1: OS-1

Runoff = 11.55 cfs @ 12.14 hrs, Volume= 0.894 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=3.00"

Area (ac)	CN	Description
6.030	89	Urban commercial, 85% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.2		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.2		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.0		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.7		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.5		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Reach 1R: (new node)

Inflow = 15.90 cfs @ 12.10 hrs, Volume= 1.164 af
Outflow = 15.88 cfs @ 12.10 hrs, Volume= 1.164 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.7 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.0 fps, Avg. Travel Time= 0.1 min

Peak Depth= 1.25'
Capacity at bank full= 22.37 cfs
24.0" Diameter Pipe n= 0.011 Length= 10.0' Slope= 0.0070 '/'

Reach 110: (new node)

Inflow = 0.73 cfs @ 12.07 hrs, Volume= 0.054 af
Outflow = 0.72 cfs @ 12.08 hrs, Volume= 0.054 af, Atten= 2%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.5 fps, Avg. Travel Time= 0.6 min

Peak Depth= 0.35'
Capacity at bank full= 1.31 cfs
8.0" Diameter Pipe n= 0.012 Length= 51.0' Slope= 0.0100 '/'

Reach 115: (new node)

Inflow = 2.24 cfs @ 12.08 hrs, Volume= 0.168 af
Outflow = 2.22 cfs @ 12.09 hrs, Volume= 0.168 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.1 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.9 fps, Avg. Travel Time= 0.7 min

Peak Depth= 0.49'
Capacity at bank full= 7.00 cfs
15.0" Diameter Pipe n= 0.012 Length= 83.0' Slope= 0.0100 '/'

Reach 118: (new node)

Inflow = 4.93 cfs @ 12.08 hrs, Volume= 0.373 af
Outflow = 4.90 cfs @ 12.09 hrs, Volume= 0.373 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.9 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.5 min

Peak Depth= 0.71'
Capacity at bank full= 10.76 cfs
18.0" Diameter Pipe n= 0.012 Length= 66.0' Slope= 0.0089 '/'

Reach 125: (new node)

Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.115 af
Outflow = 1.53 cfs @ 12.08 hrs, Volume= 0.115 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.0 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.36'
Capacity at bank full= 5.59 cfs
12.0" Diameter Pipe n= 0.012 Length= 113.0' Slope= 0.0210 '/'

Reach 128: (new node)

Inflow = 1.53 cfs @ 12.08 hrs, Volume= 0.115 af
Outflow = 1.51 cfs @ 12.09 hrs, Volume= 0.115 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.5 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.54'
Capacity at bank full= 2.71 cfs
12.0" Diameter Pipe n= 0.012 Length= 71.0' Slope= 0.0049 '/'

Reach 130: (new node)

Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.013 af
Outflow = 0.18 cfs @ 12.11 hrs, Volume= 0.013 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.2 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.7 fps, Avg. Travel Time= 0.7 min

Peak Depth= 0.11'
Capacity at bank full= 7.91 cfs
12.0" Diameter Pipe n= 0.012 Length= 74.0' Slope= 0.0420 '/'

Reach 135: (new node)

Inflow = 0.18 cfs @ 12.11 hrs, Volume= 0.013 af
Outflow = 0.17 cfs @ 12.13 hrs, Volume= 0.013 af, Atten= 5%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.8 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.0 fps, Avg. Travel Time= 1.9 min

Peak Depth= 0.11'
Capacity at bank full= 3.10 cfs
8.0" Diameter Pipe n= 0.012 Length= 225.0' Slope= 0.0560 '/'

Reach 171: (new node)

Inflow = 2.69 cfs @ 12.07 hrs, Volume= 0.198 af
Outflow = 2.68 cfs @ 12.07 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.8 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.6 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.26'
Capacity at bank full= 29.32 cfs
15.0" Diameter Pipe n= 0.012 Length= 31.0' Slope= 0.1755 '/'

Reach 172: (new node)

Inflow = 4.46 cfs @ 12.07 hrs, Volume= 0.333 af
Outflow = 4.44 cfs @ 12.08 hrs, Volume= 0.332 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 16.9 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 6.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.33'
Capacity at bank full= 28.85 cfs
15.0" Diameter Pipe n= 0.012 Length= 32.0' Slope= 0.1700 '/'

Reach 181: (new node)

Inflow = 1.82 cfs @ 12.07 hrs, Volume= 0.134 af
Outflow = 1.79 cfs @ 12.08 hrs, Volume= 0.134 af, Atten= 2%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.7 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.9 fps, Avg. Travel Time= 0.7 min

Peak Depth= 0.31'
Capacity at bank full= 13.83 cfs
15.0" Diameter Pipe n= 0.012 Length= 125.0' Slope= 0.0390 '/'

Reach 210: (new node)

Inflow = 1.66 cfs @ 12.07 hrs, Volume= 0.123 af
Outflow = 1.61 cfs @ 12.09 hrs, Volume= 0.122 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.1 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.6 fps, Avg. Travel Time= 1.5 min

Peak Depth= 0.51'
Capacity at bank full= 3.23 cfs
12.0" Diameter Pipe n= 0.012 Length= 147.0' Slope= 0.0070 '/'

Reach 220: (new node)

Inflow = 4.90 cfs @ 12.09 hrs, Volume= 0.373 af
Outflow = 4.85 cfs @ 12.10 hrs, Volume= 0.373 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.4 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.3 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.44'
Capacity at bank full= 26.19 cfs
18.0" Diameter Pipe n= 0.012 Length= 218.0' Slope= 0.0530 '/'

Reach 230: (new node)

Inflow = 12.36 cfs @ 12.08 hrs, Volume= 0.889 af
Outflow = 12.35 cfs @ 12.09 hrs, Volume= 0.889 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 25.9 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.5 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.47'
Capacity at bank full= 57.69 cfs
18.0" Diameter Pipe n= 0.012 Length= 71.0' Slope= 0.2570 '/'

Reach 240: (new node)

Inflow = 12.35 cfs @ 12.09 hrs, Volume= 0.889 af
Outflow = 12.33 cfs @ 12.09 hrs, Volume= 0.889 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 22.9 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 8.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.52'
Capacity at bank full= 48.44 cfs
18.0" Diameter Pipe n= 0.012 Length= 69.0' Slope= 0.1812 '/'

Reach 250: (new node)

Inflow = 12.33 cfs @ 12.09 hrs, Volume= 0.889 af
Outflow = 12.32 cfs @ 12.09 hrs, Volume= 0.889 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.9 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.73'
Capacity at bank full= 43.43 cfs
24.0" Diameter Pipe n= 0.011 Length= 36.0' Slope= 0.0264 '/'

Reach 260: (new node)

Inflow = 12.32 cfs @ 12.09 hrs, Volume= 0.889 af
Outflow = 12.29 cfs @ 12.09 hrs, Volume= 0.889 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.5 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.8 fps, Avg. Travel Time= 0.2 min

Peak Depth= 1.04'
Capacity at bank full= 23.22 cfs
24.0" Diameter Pipe n= 0.012 Length= 39.0' Slope= 0.0090 '/'

Reach 410: (new node)

Inflow = 1.54 cfs @ 12.07 hrs, Volume= 0.114 af
Outflow = 1.52 cfs @ 12.08 hrs, Volume= 0.114 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.6 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.53'
Capacity at bank full= 2.77 cfs
12.0" Diameter Pipe n= 0.012 Length= 35.0' Slope= 0.0051 '/'

Reach 510: (new node)

Inflow = 6.89 cfs @ 12.07 hrs, Volume= 0.465 af
Outflow = 6.88 cfs @ 12.07 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 26.2 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.4 fps, Avg. Travel Time= 0.0 min

Peak Depth= 0.31'
Capacity at bank full= 74.96 cfs
18.0" Diameter Pipe n= 0.012 Length= 23.0' Slope= 0.4339 '/'

Reach 810: (new node)

Inflow = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af
Outflow = 2.53 cfs @ 12.08 hrs, Volume= 0.171 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.5 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.3 fps, Avg. Travel Time= 0.6 min

Peak Depth= 0.28'
Capacity at bank full= 15.48 cfs
12.0" Diameter Pipe n= 0.012 Length= 200.0' Slope= 0.1608 '/'

Reach 820: (new node)

Inflow = 2.53 cfs @ 12.08 hrs, Volume= 0.171 af
Outflow = 2.51 cfs @ 12.09 hrs, Volume= 0.171 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.2 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.5 fps, Avg. Travel Time= 0.7 min

Peak Depth= 0.31'
Capacity at bank full= 12.21 cfs
12.0" Diameter Pipe n= 0.012 Length= 192.0' Slope= 0.1000 '/'

Reach AST: (new node)

Inflow = 15.99 cfs @ 12.09 hrs, Volume= 1.164 af
Outflow = 15.90 cfs @ 12.10 hrs, Volume= 1.164 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 19.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 7.6 fps, Avg. Travel Time= 0.5 min

Peak Depth= 0.78'
Capacity at bank full= 22.39 cfs
15.0" Diameter Pipe n= 0.011 Length= 214.0' Slope= 0.0860 '/'

Reach pipe: (new node)

Inflow = 1.26 cfs @ 12.08 hrs, Volume= 0.083 af
Outflow = 1.26 cfs @ 12.08 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.6 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.2 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.33'
Capacity at bank full= 5.46 cfs
12.0" Diameter Pipe n= 0.012 Length= 10.0' Slope= 0.0200 '/'

Pond 2P: (new node)

Inflow = 0.46 cfs @ 12.08 hrs, Volume= 0.031 af
Outflow = 0.46 cfs @ 12.08 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.1 min
Primary = 0.46 cfs @ 12.08 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 107.29' Storage= 4 cf
Plug-Flow detention time= 0.3 min calculated for 0.031 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Primary OutFlow (Free Discharge)
└─1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	107.00'	**18.0" x 50.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 106.50' S= 0.0100 '/' n= 0.011 Cc= 0.900

Pond 3P: (new node)

Inflow = 0.77 cfs @ 12.08 hrs, Volume= 0.052 af
Primary = 0.77 cfs @ 12.08 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 5P: (new node)

Inflow = 6.89 cfs @ 12.07 hrs, Volume= 0.465 af
Primary = 6.89 cfs @ 12.07 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 6P: (new node)

Inflow = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af
Primary = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 7P: (new node)

Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af
Primary = 0.64 cfs @ 12.12 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 8P: (new node)

Inflow = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af
Primary = 2.55 cfs @ 12.08 hrs, Volume= 0.171 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 9P: (new node)

Inflow = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af
Primary = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 10P: (new node)

Inflow = 3.24 cfs @ 12.08 hrs, Volume= 0.230 af
Primary = 3.24 cfs @ 12.08 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 11P: (new node)

Inflow = 0.73 cfs @ 12.07 hrs, Volume= 0.054 af
Primary = 0.73 cfs @ 12.07 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 12P: (new node)

Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.115 af
Primary = 1.56 cfs @ 12.07 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 16p: (new node)

Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond CB-63: (new node)

Inflow = 3.13 cfs @ 12.10 hrs, Volume= 0.235 af
Outflow = 3.13 cfs @ 12.10 hrs, Volume= 0.235 af, Atten= 0%, Lag= 0.1 min
Primary = 3.13 cfs @ 12.10 hrs, Volume= 0.235 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 60.98' Storage= 15 cf
Plug-Flow detention time= 0.2 min calculated for 0.235 af (100% of inflow)
Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Primary OutFlow (Free Discharge)
└1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	59.80'	**12.0" x 10.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 58.46' S= 0.1340 '/' n= 0.012 Cc= 0.900

Pond dmh-20: (new node)

Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.088 af
Primary = 1.30 cfs @ 12.09 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond hil-01: (new node)

Inflow = 1.82 cfs @ 12.07 hrs, Volume= 0.134 af
Primary = 1.82 cfs @ 12.07 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond hil-02: (new node)

Inflow = 12.32 cfs @ 12.09 hrs, Volume= 0.889 af
Primary = 12.32 cfs @ 12.09 hrs, Volume= 0.889 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond OS-1.: (new node)

Inflow = 11.55 cfs @ 12.14 hrs, Volume= 0.894 af
Primary = 11.55 cfs @ 12.14 hrs, Volume= 0.894 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SMH-13: (new node)

Inflow = 15.49 cfs @ 12.12 hrs, Volume= 1.239 af
Primary = 15.49 cfs @ 12.12 hrs, Volume= 1.239 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SMH-20: (new node)

Inflow = 4.46 cfs @ 12.07 hrs, Volume= 0.333 af
Primary = 4.46 cfs @ 12.07 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-1: (new node)

Inflow = 1.26 cfs @ 12.08 hrs, Volume= 0.083 af
Primary = 1.26 cfs @ 12.08 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-2: (new node)

Inflow = 15.49 cfs @ 12.12 hrs, Volume= 1.239 af
Primary = 15.49 cfs @ 12.12 hrs, Volume= 1.239 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond sp-3: (new node)

Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.088 af
Primary = 1.30 cfs @ 12.09 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-4: (new node)

Inflow = 15.99 cfs @ 12.09 hrs, Volume= 1.164 af
Primary = 15.99 cfs @ 12.09 hrs, Volume= 1.164 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-5: (new node)

Inflow = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af
Primary = 5.07 cfs @ 12.07 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-6: (new node)

Inflow = 3.24 cfs @ 12.08 hrs, Volume= 0.230 af
Primary = 3.24 cfs @ 12.08 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond SP-7: (new node)

Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=4.70"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=84 Area=0.448 ac Runoff= 1.57 cfs 0.105 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.568 ac Runoff= 2.63 cfs 0.196 af

Subcatchment 2B: (new node)
Tc=5.0 min CN=80 Area=0.320 ac Runoff= 0.99 cfs 0.066 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=98 Area=0.384 ac Runoff= 1.78 cfs 0.133 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=89 Area=0.347 ac Runoff= 1.39 cfs 0.095 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 2.44 cfs 0.182 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=91 Area=2.860 ac Runoff= 11.97 cfs 0.832 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=91 Area=0.251 ac Runoff= 1.05 cfs 0.073 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 2.98 cfs 0.210 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 4.61 cfs 0.315 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 8.66 cfs 0.607 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=87 Area=0.853 ac Runoff= 3.25 cfs 0.220 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.249 ac Runoff= 1.15 cfs 0.086 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.533 ac Runoff= 2.46 cfs 0.184 af

Subcatchment 13s: (new node)
Tc=6.2 min CN=78 Area=0.146 ac Runoff= 0.41 cfs 0.028 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=76 Area=1.140 ac Runoff= 3.06 cfs 0.202 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=43 Area=0.241 ac Runoff= 0.02 cfs 0.005 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=98 Area=0.093 ac Runoff= 0.43 cfs 0.032 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 4.25 cfs 0.317 af

Subcatchment 18S: (new node)
Tc=5.0 min CN=98 Area=0.623 ac Runoff= 2.88 cfs 0.215 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 20.76 cfs 1.651 af

Reach 1R: (new node)
Inflow= 22.39 cfs 2.120 af
Length= 10.0' Max Vel= 8.1 fps Capacity= 22.37 cfs Outflow= 22.39 cfs 2.120 af

Reach 110: (new node)
Inflow= 1.15 cfs 0.086 af
Length= 51.0' Max Vel= 4.2 fps Capacity= 1.31 cfs Outflow= 1.13 cfs 0.086 af

Reach 115: (new node)
Inflow= 3.54 cfs 0.268 af
Length= 83.0' Max Vel= 5.7 fps Capacity= 7.00 cfs Outflow= 3.51 cfs 0.268 af

Reach 118: (new node)
Inflow= 7.81 cfs 0.597 af
Length= 66.0' Max Vel= 6.6 fps Capacity= 10.76 cfs Outflow= 7.77 cfs 0.597 af

Reach 125: (new node)
Inflow= 2.46 cfs 0.184 af
Length= 113.0' Max Vel= 6.8 fps Capacity= 5.59 cfs Outflow= 2.42 cfs 0.184 af

Reach 128: (new node)
Inflow= 2.42 cfs 0.184 af
Length= 71.0' Max Vel= 3.9 fps Capacity= 2.71 cfs Outflow= 2.40 cfs 0.184 af

Reach 130: (new node)
Inflow= 0.41 cfs 0.028 af
Length= 74.0' Max Vel= 5.3 fps Capacity= 7.91 cfs Outflow= 0.41 cfs 0.028 af

Reach 135: (new node)
Inflow= 0.41 cfs 0.028 af
Length= 225.0' Max Vel= 6.1 fps Capacity= 3.10 cfs Outflow= 0.39 cfs 0.028 af

Reach 171: (new node)
Inflow= 4.25 cfs 0.317 af
Length= 31.0' Max Vel= 16.9 fps Capacity= 29.32 cfs Outflow= 4.24 cfs 0.317 af

Reach 172: (new node)
Inflow= 7.06 cfs 0.532 af
Length= 32.0' Max Vel= 19.2 fps Capacity= 28.85 cfs Outflow= 7.02 cfs 0.532 af

Reach 181: (new node) Inflow= 2.88 cfs 0.215 af
Length= 125.0' Max Vel= 8.8 fps Capacity= 13.83 cfs Outflow= 2.83 cfs 0.215 af

Reach 210: (new node) Inflow= 2.63 cfs 0.196 af
Length= 147.0' Max Vel= 4.6 fps Capacity= 3.23 cfs Outflow= 2.56 cfs 0.196 af

Reach 220: (new node) Inflow= 7.77 cfs 0.597 af
Length= 218.0' Max Vel= 12.9 fps Capacity= 26.19 cfs Outflow= 7.69 cfs 0.597 af

Reach 230: (new node) Inflow= 20.79 cfs 1.523 af
Length= 71.0' Max Vel= 29.9 fps Capacity= 57.69 cfs Outflow= 20.77 cfs 1.523 af

Reach 240: (new node) Inflow= 20.77 cfs 1.523 af
Length= 69.0' Max Vel= 26.3 fps Capacity= 48.44 cfs Outflow= 20.74 cfs 1.523 af

Reach 250: (new node) Inflow= 20.74 cfs 1.523 af
Length= 36.0' Max Vel= 13.6 fps Capacity= 43.43 cfs Outflow= 20.72 cfs 1.523 af

Reach 260: (new node) Inflow= 20.72 cfs 1.523 af
Length= 39.0' Max Vel= 8.3 fps Capacity= 23.22 cfs Outflow= 20.68 cfs 1.523 af

Reach 410: (new node) Inflow= 2.44 cfs 0.182 af
Length= 35.0' Max Vel= 4.0 fps Capacity= 2.77 cfs Outflow= 2.41 cfs 0.182 af

Reach 510: (new node) Inflow= 11.97 cfs 0.832 af
Length= 23.0' Max Vel= 30.8 fps Capacity= 74.96 cfs Outflow= 11.96 cfs 0.832 af

Reach 810: (new node) Inflow= 4.61 cfs 0.315 af
Length= 200.0' Max Vel= 17.0 fps Capacity= 15.48 cfs Outflow= 4.54 cfs 0.315 af

Reach 820: (new node) Inflow= 4.54 cfs 0.315 af
Length= 192.0' Max Vel= 14.4 fps Capacity= 12.21 cfs Outflow= 4.51 cfs 0.315 af

Reach AST: (new node) Inflow= 29.21 cfs 2.121 af
Length= 214.0' Max Vel= 20.7 fps Capacity= 22.39 cfs Outflow= 22.39 cfs 2.120 af

Reach pipe: (new node) Inflow= 2.55 cfs 0.170 af
Length= 10.0' Max Vel= 6.8 fps Capacity= 5.46 cfs Outflow= 2.55 cfs 0.170 af

Pond 2P: (new node) Peak Storage= 6 cf Inflow= 0.99 cfs 0.066 af
Primary= 0.99 cfs 0.066 af Outflow= 0.99 cfs 0.066 af

Pond 3P: (new node) Inflow= 1.39 cfs 0.095 af
Primary= 1.39 cfs 0.095 af

Pond 5P: (new node) Inflow= 11.97 cfs 0.832 af
Primary= 11.97 cfs 0.832 af

Pond 6P: (new node) Inflow= 1.05 cfs 0.073 af
Primary= 1.05 cfs 0.073 af

Pond 7P: (new node) Inflow= 2.98 cfs 0.210 af
Primary= 2.98 cfs 0.210 af

Pond 8P: (new node) Inflow= 4.61 cfs 0.315 af
Primary= 4.61 cfs 0.315 af

Pond 9P: (new node) Inflow= 8.66 cfs 0.607 af
Primary= 8.66 cfs 0.607 af

Pond 10P: (new node) Inflow= 5.61 cfs 0.404 af
Primary= 5.61 cfs 0.404 af

Pond 11P: (new node) Inflow= 1.15 cfs 0.086 af
Primary= 1.15 cfs 0.086 af

Pond 12P: (new node) Inflow= 2.46 cfs 0.184 af
Primary= 2.46 cfs 0.184 af

Pond 16p: (new node) Inflow= 0.43 cfs 0.032 af
Primary= 0.43 cfs 0.032 af

Pond CB-63: (new node) Peak Storage= 58 cf Inflow= 7.50 cfs 0.525 af
Primary= 7.51 cfs 0.525 af Outflow= 7.51 cfs 0.525 af

Pond dmh-20: (new node) Inflow= 3.06 cfs 0.202 af
Primary= 3.06 cfs 0.202 af

Pond hil-01: (new node) Inflow= 2.88 cfs 0.215 af
Primary= 2.88 cfs 0.215 af

Pond hil-02: (new node) Inflow= 20.72 cfs 1.523 af
Primary= 20.72 cfs 1.523 af

Pond OS-1.: (new node) Inflow= 20.76 cfs 1.651 af
Primary= 20.76 cfs 1.651 af

Pond SMH-13: (new node) Inflow= 27.15 cfs 2.211 af
Primary= 27.15 cfs 2.211 af

Pond SMH-20: (new node) Inflow= 7.06 cfs 0.532 af
Primary= 7.06 cfs 0.532 af

Pond SP-1: (new node) Inflow= 2.55 cfs 0.170 af
Primary= 2.55 cfs 0.170 af

Pond SP-2: (new node)
Inflow= 27.15 cfs 2.211 af
Primary= 27.15 cfs 2.211 af

Pond sp-3: (new node)
Inflow= 3.06 cfs 0.206 af
Primary= 3.06 cfs 0.206 af

Pond SP-4: (new node)
Inflow= 29.21 cfs 2.121 af
Primary= 29.21 cfs 2.121 af

Pond SP-5: (new node)
Inflow= 8.66 cfs 0.607 af
Primary= 8.66 cfs 0.607 af

Pond SP-6: (new node)
Inflow= 5.61 cfs 0.404 af
Primary= 5.61 cfs 0.404 af

Pond SP-7: (new node)
Inflow= 0.43 cfs 0.032 af
Primary= 0.43 cfs 0.032 af

Runoff Area = 21.928 ac Volume = 5.754 af Average Depth = 3.15"

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Type III 24-hr Rainfall=5.50"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: (new node)
Tc=5.0 min CN=84 Area=0.448 ac Runoff= 1.95 cfs 0.131 af

Subcatchment 2A: (new node)
Tc=5.0 min CN=98 Area=0.568 ac Runoff= 3.08 cfs 0.231 af

Subcatchment 2B: (new node)
Tc=5.0 min CN=80 Area=0.320 ac Runoff= 1.25 cfs 0.083 af

Subcatchment 2S: (new node)
Tc=5.0 min CN=98 Area=0.384 ac Runoff= 2.08 cfs 0.156 af

Subcatchment 3S: (new node)
Tc=5.0 min CN=89 Area=0.347 ac Runoff= 1.68 cfs 0.116 af

Subcatchment 4S: (new node)
Tc=5.0 min CN=98 Area=0.528 ac Runoff= 2.86 cfs 0.214 af

Subcatchment 5S: (new node)
Tc=5.0 min CN=91 Area=2.860 ac Runoff= 14.34 cfs 1.007 af

Subcatchment 6S: (new node)
Tc=5.0 min CN=91 Area=0.251 ac Runoff= 1.26 cfs 0.088 af

Subcatchment 7S: (new node)
Tc=5.0 min CN=62 Area=2.216 ac Runoff= 4.34 cfs 0.296 af

Subcatchment 8S: (new node)
Tc=5.0 min CN=89 Area=1.150 ac Runoff= 5.57 cfs 0.385 af

Subcatchment 9S: (new node)
Tc=5.0 min CN=92 Area=2.030 ac Runoff= 10.34 cfs 0.732 af

Subcatchment 10S: (new node)
Tc=5.0 min CN=87 Area=0.853 ac Runoff= 3.97 cfs 0.271 af

Subcatchment 11S: (new node)
Tc=5.0 min CN=98 Area=0.249 ac Runoff= 1.35 cfs 0.101 af

Subcatchment 12S: (new node)
Tc=5.0 min CN=98 Area=0.533 ac Runoff= 2.89 cfs 0.216 af

Subcatchment 13s: (new node)
Tc=6.2 min CN=78 Area=0.146 ac Runoff= 0.52 cfs 0.036 af

Subcatchment 14S: (new node)
Tc=5.0 min CN=76 Area=1.140 ac Runoff= 3.95 cfs 0.261 af

Subcatchment 15S: (new node)
Tc=5.0 min CN=43 Area=0.241 ac Runoff= 0.06 cfs 0.009 af

Subcatchment 16S: (new node)
Tc=5.0 min CN=98 Area=0.093 ac Runoff= 0.50 cfs 0.038 af

Subcatchment 17S: (new node)
Tc=5.0 min CN=98 Area=0.918 ac Runoff= 4.98 cfs 0.373 af

Subcatchment 18S: (new node)
Tc=5.0 min CN=98 Area=0.623 ac Runoff= 3.38 cfs 0.253 af

Subcatchment OS-1: OS-1
Tc=10.0 min CN=89 Area=6.030 ac Runoff= 25.09 cfs 2.017 af

Reach 1R: (new node)
Inflow= 22.39 cfs 2.592 af
Length= 10.0' Max Vel= 8.1 fps Capacity= 22.37 cfs Outflow= 22.43 cfs 2.592 af

Reach 110: (new node)
Inflow= 1.35 cfs 0.101 af
Length= 51.0' Max Vel= 4.3 fps Capacity= 1.31 cfs Outflow= 1.33 cfs 0.101 af

Reach 115: (new node)
Inflow= 4.15 cfs 0.315 af
Length= 83.0' Max Vel= 5.9 fps Capacity= 7.00 cfs Outflow= 4.12 cfs 0.315 af

Reach 118: (new node)
Inflow= 9.15 cfs 0.702 af
Length= 66.0' Max Vel= 6.8 fps Capacity= 10.76 cfs Outflow= 9.11 cfs 0.702 af

Reach 125: (new node)
Inflow= 2.89 cfs 0.216 af
Length= 113.0' Max Vel= 7.1 fps Capacity= 5.59 cfs Outflow= 2.84 cfs 0.216 af

Reach 128: (new node)
Inflow= 2.84 cfs 0.216 af
Length= 71.0' Max Vel= 3.9 fps Capacity= 2.71 cfs Outflow= 2.81 cfs 0.216 af

Reach 130: (new node)
Inflow= 0.52 cfs 0.036 af
Length= 74.0' Max Vel= 5.7 fps Capacity= 7.91 cfs Outflow= 0.52 cfs 0.036 af

Reach 135: (new node)
Inflow= 0.52 cfs 0.036 af
Length= 225.0' Max Vel= 6.6 fps Capacity= 3.10 cfs Outflow= 0.51 cfs 0.036 af

Reach 171: (new node)
Inflow= 4.98 cfs 0.373 af
Length= 31.0' Max Vel= 17.7 fps Capacity= 29.32 cfs Outflow= 4.97 cfs 0.373 af

Reach 172: (new node)
Inflow= 8.28 cfs 0.626 af
Length= 32.0' Max Vel= 20.1 fps Capacity= 28.85 cfs Outflow= 8.26 cfs 0.626 af

Reach 181: (new node) Inflow= 3.38 cfs 0.253 af
Length= 125.0' Max Vel= 9.2 fps Capacity= 13.83 cfs Outflow= 3.32 cfs 0.253 af

Reach 210: (new node) Inflow= 3.08 cfs 0.231 af
Length= 147.0' Max Vel= 4.7 fps Capacity= 3.23 cfs Outflow= 3.00 cfs 0.231 af

Reach 220: (new node) Inflow= 9.11 cfs 0.702 af
Length= 218.0' Max Vel= 13.5 fps Capacity= 26.19 cfs Outflow= 9.03 cfs 0.701 af

Reach 230: (new node) Inflow= 24.73 cfs 1.824 af
Length= 71.0' Max Vel= 31.3 fps Capacity= 57.69 cfs Outflow= 24.70 cfs 1.824 af

Reach 240: (new node) Inflow= 24.70 cfs 1.824 af
Length= 69.0' Max Vel= 27.4 fps Capacity= 48.44 cfs Outflow= 24.68 cfs 1.824 af

Reach 250: (new node) Inflow= 24.68 cfs 1.824 af
Length= 36.0' Max Vel= 14.2 fps Capacity= 43.43 cfs Outflow= 24.65 cfs 1.824 af

Reach 260: (new node) Inflow= 24.65 cfs 1.824 af
Length= 39.0' Max Vel= 8.4 fps Capacity= 23.22 cfs Outflow= 24.59 cfs 1.824 af

Reach 410: (new node) Inflow= 2.86 cfs 0.214 af
Length= 35.0' Max Vel= 4.0 fps Capacity= 2.77 cfs Outflow= 2.82 cfs 0.214 af

Reach 510: (new node) Inflow= 14.34 cfs 1.007 af
Length= 23.0' Max Vel= 32.4 fps Capacity= 74.96 cfs Outflow= 14.33 cfs 1.007 af

Reach 810: (new node) Inflow= 5.57 cfs 0.385 af
Length= 200.0' Max Vel= 17.9 fps Capacity= 15.48 cfs Outflow= 5.49 cfs 0.385 af

Reach 820: (new node) Inflow= 5.49 cfs 0.385 af
Length= 192.0' Max Vel= 15.1 fps Capacity= 12.21 cfs Outflow= 5.46 cfs 0.385 af

Reach AST: (new node) Inflow= 35.64 cfs 2.593 af
Length= 214.0' Max Vel= 20.8 fps Capacity= 22.39 cfs Outflow= 22.39 cfs 2.592 af

Reach pipe: (new node) Inflow= 3.18 cfs 0.214 af
Length= 10.0' Max Vel= 7.2 fps Capacity= 5.46 cfs Outflow= 3.18 cfs 0.214 af

Pond 2P: (new node) Peak Storage= 6 cf Inflow= 1.25 cfs 0.083 af
Primary= 1.25 cfs 0.083 af Outflow= 1.25 cfs 0.083 af

Pond 3P: (new node) Inflow= 1.68 cfs 0.116 af
Primary= 1.68 cfs 0.116 af

Pond 5P: (new node) Inflow= 14.34 cfs 1.007 af
Primary= 14.34 cfs 1.007 af

Pond 6P: (new node)
Inflow= 1.26 cfs 0.088 af
Primary= 1.26 cfs 0.088 af

Pond 7P: (new node)
Inflow= 4.34 cfs 0.296 af
Primary= 4.34 cfs 0.296 af

Pond 8P: (new node)
Inflow= 5.57 cfs 0.385 af
Primary= 5.57 cfs 0.385 af

Pond 9P: (new node)
Inflow= 10.34 cfs 0.732 af
Primary= 10.34 cfs 0.732 af

Pond 10P: (new node)
Inflow= 6.72 cfs 0.487 af
Primary= 6.72 cfs 0.487 af

Pond 11P: (new node)
Inflow= 1.35 cfs 0.101 af
Primary= 1.35 cfs 0.101 af

Pond 12P: (new node)
Inflow= 2.89 cfs 0.216 af
Primary= 2.89 cfs 0.216 af

Pond 16p: (new node)
Inflow= 0.50 cfs 0.038 af
Primary= 0.50 cfs 0.038 af

Pond CB-63: (new node)
Peak Storage= 94 cf Inflow= 9.80 cfs 0.681 af
Primary= 9.83 cfs 0.681 af Outflow= 9.83 cfs 0.681 af

Pond dmh-20: (new node)
Inflow= 3.95 cfs 0.261 af
Primary= 3.95 cfs 0.261 af

Pond hil-01: (new node)
Inflow= 3.38 cfs 0.253 af
Primary= 3.38 cfs 0.253 af

Pond hil-02: (new node)
Inflow= 24.65 cfs 1.824 af
Primary= 24.65 cfs 1.824 af

Pond OS-1.: (new node)
Inflow= 25.09 cfs 2.017 af
Primary= 25.09 cfs 2.017 af

Pond SMH-13: (new node)
Inflow= 32.63 cfs 2.678 af
Primary= 32.63 cfs 2.678 af

Pond SMH-20: (new node)
Inflow= 8.28 cfs 0.626 af
Primary= 8.28 cfs 0.626 af

Pond SP-1: (new node)
Inflow= 3.18 cfs 0.214 af
Primary= 3.18 cfs 0.214 af

Pond SP-2: (new node)
Inflow= 32.63 cfs 2.678 af
Primary= 32.63 cfs 2.678 af

Pond sp-3: (new node)
Inflow= 3.98 cfs 0.270 af
Primary= 3.98 cfs 0.270 af

Pond SP-4: (new node)
Inflow= 35.64 cfs 2.593 af
Primary= 35.64 cfs 2.593 af

Pond SP-5: (new node)
Inflow= 10.34 cfs 0.732 af
Primary= 10.34 cfs 0.732 af

Pond SP-6: (new node)
Inflow= 6.72 cfs 0.487 af
Primary= 6.72 cfs 0.487 af

Pond SP-7: (new node)
Inflow= 0.50 cfs 0.038 af
Primary= 0.50 cfs 0.038 af

Runoff Area = 21.928 ac Volume = 7.014 af Average Depth = 3.84"

Section 13

Maintenance of Common Facilities or Property

Maintenance of Common Facilities or Property

Stormwater Treatment Unit Maintenance

Proprietary stormwater treatment units will be maintained at intervals and by procedures recommended by the manufacturer. During the first year of operation, the units will be inspected every six months to determine the rate of sediment and floatable accumulation. This information will be kept recorded on maintenance logs on site to document maintenance efforts and to establish a maintenance schedule. At a minimum, the units will be inspected and accumulated sediment removed annually following paving maintenance. A copy of the manufacturer's recommended maintenance procedures and logs are attached, along with a stormwater infrastructure maintenance plan.

01046

STORMWATER INFRASTRUCTURE MAINTENANCE PLAN

The owner/developer for the proposed expansion is Maine Medical Center. The address for Maine Medical Center is 22 Bramhall Street in Portland, Maine; the telephone number is (207) 871-0111. Maintenance responsibility for the drainage infrastructure will be the responsibility of the site contractor until such time as the infrastructure is accepted by Maine Medical Center.

1. After each significant rainfall event or at least bi-monthly, drainage infrastructure and slope areas will be visually inspected to assure that no signs of erosion are apparent.

2. Any signs of erosion shall be immediately repaired to assure vigorous growth of vegetation and the stability and functioning structures. Any blockage of structures shall be immediately repaired.

3. Embankments will be maintained to preserve their integrity and function. Maintenance will include mowing, control of woody vegetation, erosion control, and repair.

4. Paved surfaces and catch basins shall be swept or vacuumed at least annually in the spring to remove all winter sand and periodically during the year on an as-needed basis to minimize the transportation of sediment during rainfall events.

5. Downstream Defender treatment units shall be maintained per the attached manufacturer specifications. This information will be kept recorded on maintenance logs on site to document maintenance efforts and to establish a maintenance schedule. Maintenance logs for the treatment units are also attached.

DLR/APP:app/jc
December 15, 2003

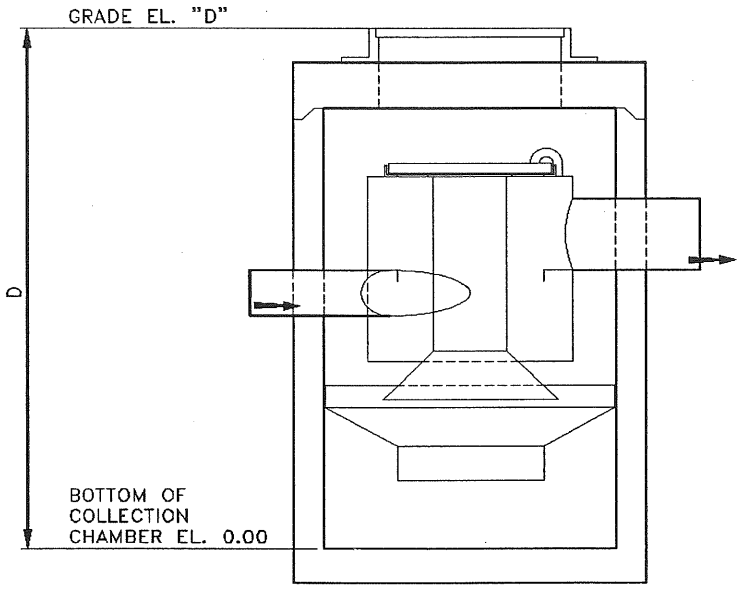
DOWNSTREAM DEFENDER MAINTENANCE LOG

Hydro Ref. No.: Site Name: Site Location:			
Owner:		Contractor:	
Contact Name:		Contact Name:	
Company Name:		Company Name:	
Address:		Address:	
Telephone:		Telephone:	
Fax:		Fax:	

Installation Date:___/___/___

Downstream Defender
Diameter:_____

Downstream Defender
Depth: ("D"):_____



H.I.L. Technology, Inc. • 94 Hutchins Drive • Portland, Maine 04102
Tel: (207) 756-6200 • Fax: (207) 756-6212 • E-mail: hiltech@hil-tech.com
H.I.L. Technology, Inc. is a subsidiary of Hydro International plc

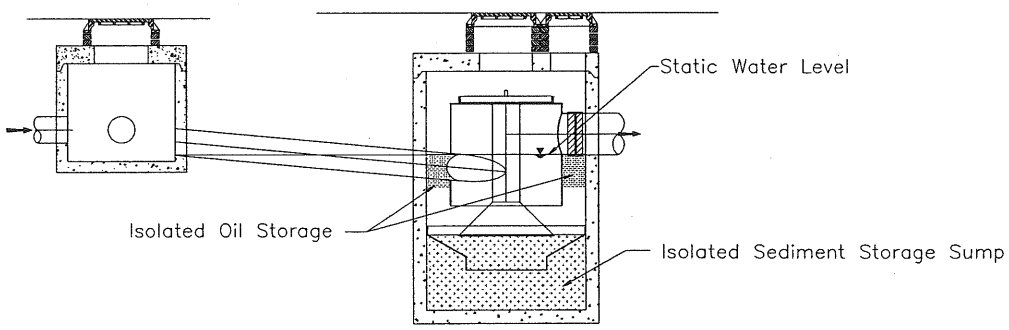
DOWNSTREAM DEFENDER MAINTENANCE LOG

Date	Initials	Depth of Floatables and Oils	Sediment Depth ("D" less measurement)	Volume of Sediment Removed	Site Activity/Comments

DOWNSTREAM DEFENDER
OPERATION AND MAINTENANCE

The Downstream Defender operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. Therefore, no procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The Downstream Defender has been designed to allow for easy and safe access for inspection/monitoring and clean-out procedures. Entry into the unit or removal of the internal components is not necessary for maintenance so that safety concerns related to confined-space-entry are avoided.

The internal components of the Downstream Defender have been designed to protect the oil, floatables and sediment storage volumes so that treatment capacities are not reduced as pollutants accumulate between clean-outs. Additionally, the Downstream Defender is designed and installed into the storm drain system so that the vessel remains wet between storm events. Oil and floatables are stored on the water surface in the outer annulus separate from the sediment storage volume in the sump of the unit providing the option for separate oil disposal, such as adsorbant pads. Since the oil and floatables storage volumes are isolated from the sediment storage, only the pollutant volumes need to be removed. The units are typically not completely drained, which minimizes disposal costs.



H.I.L. Technology, Inc. • 94 Hutchins Drive • Portland, Maine 04102
Tel: (207) 756-6200 • Fax: (207) 756-6212 • E-mail: hiltech@hil-tech.com
H.I.L. Technology, Inc. is a subsidiary of Hydro International plc

Keeping the unit wet also prevents stored sediment from solidifying in the base of the unit. The clean-out procedure becomes much more difficult and labor intensive if the system allows fine sediment to dry-out and consolidate. When this occurs, clean-out crews must enter the chamber and manually remove the sediment; a labor intensive operation in a hazardous environment.

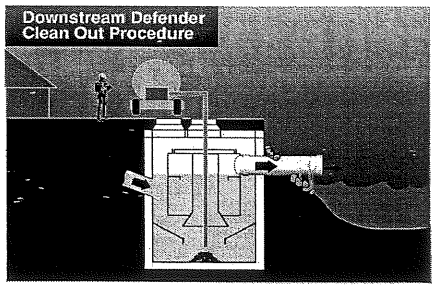
The Downstream Defender has large clear openings and no internal restrictions or weirs, minimizing the risk of blockage and hydraulic losses. Orifices and internal weirs can create two serious hydraulic problems:

1. Increased risk of blockage - Small orifices tend to collect debris and trash such as soda cans, sticks and Styrofoam cups which further reduce opening size and may even block openings completely. This alters the hydraulics in a flow-through treatment device, adversely affecting operation and performance and can eventually lead to system back-ups and maintenance issues. Removing debris from a submerged orifice may require pumping down the chamber.

2. Increased headlosses - Internal restrictions and weirs significantly increase hydraulic losses in a flow-through treatment device. The higher the flow through the system, the higher the headloss. This problem is exacerbated during the more intense storm events, backing up the storm sewer and increasing the risk for upstream flooding.

MAINTENANCE PROCEDURE

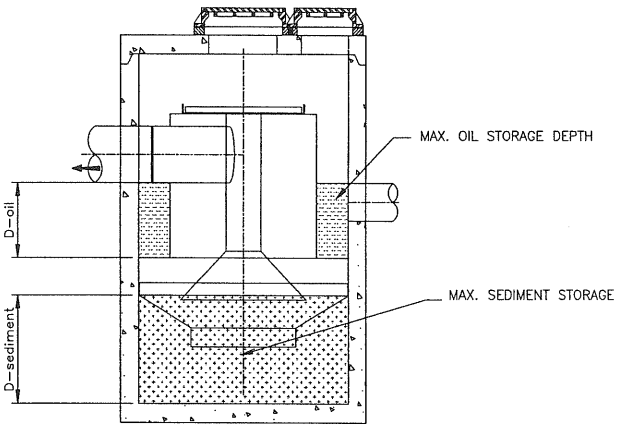
A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole. The floatables access port is above the area between the concrete manhole wall and the dip plate. The sediment removal access port is located directly over the hollow center shaft.



The frequency of the sump vac procedure is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe can be used to determine the level of solids in the sediment storage facility. This information can be recorded in the attached maintenance logs to establish a routine maintenance schedule. Maximum pollutant storage capacities are provided in the following chart.

In order to minimize disposal costs, removing oil and floatables prior to removing sediment is recommended. Removing the entire oil, floatables and sediment storage volumes is not required unless the pollutant depths are equal to the maximum storage capacities as indicated in the chart shown below. The vactor procedure for a typical 6-ft diameter Downstream Defender with one foot of sediment depth and two inches of oil and debris takes less than 30 minutes and removes about 150 gallons of water in the process.

DOWNSTREAM DEFENDER
MAXIMUM STORAGE DEPTHS



UNIT DIAMETER	TOTAL OIL STORAGE	OIL CLEAN-OUT DEPTH	TOTAL SEDIMENT STORAGE	SEDIEMNT CLEAN-OUT DEPTH	UNIT DIAMETER
(FEET)	(GAL.)	(INCHES)	(GAL.)	(INCHES)	(FEET)
4	70	<16	141	<18	4
6	230	<23	424	<24	6
8	525	<33	939	<30	8
10	1050	<42	1,757	<36	10

NOTES: 1. OIL ACCUMULATION IS TYPICALLY MUCH LESS THAN SEDIMENT, HOWEVER, REMOVAL OF OIL AND SEDIMENT DURING THE SAME SERVICE IS RECOMMENDED.

2. IT IS NOT NECESSARY TO DRAIN THE UNIT'S ENTIRE VOLUME. REMOVAL OF FLOATABLES FIRST, THEN ONLY THE UNIT'S SEDIMENT STORAGE VOLUME AS INDICATED IN THE ABOVE CHART IS RECOMMENDED.

Section 14

Erosion and Sedimentation Control

Section 14

EROSION AND SEDIMENT CONTROL PLAN

Narrative

The project site occupies an area bounded by Congress Street, Wescott Street, Charles Street, Ellsworth Street, Gilman Street and Crescent Street in Portland. The site is located in a densely developed urban setting consisting of hospital and office buildings with their associated parking and landscaped areas, public roadways and multi-family residential housing. The undeveloped areas of the site consist of steeply sloped land abutting Congress Street and Gilman Street. Ground cover in this area consists primarily of grass, brush and hardwood tree growth tree growth.

Currently, there do not appear to be any existing erosion problems on the site. Underlying the noted cover types is Hinckley gravelly sandy loam, hydrologic soil group A. The project geotechnical report indicates significant areas of granular fill on the site overlying glacial till.

The long-term potential for erosion from the site is low, as the redeveloped site will be primarily paved and rooftop impervious areas, and landscaped lawn areas. Erosion potential will be higher during construction as large areas of the site will be disturbed. The primary route for potential erosion off site during construction will be via overland flow at the down gradient sides of the site and via existing and proposed catch basins and storm drains on site. The primary erosion control measures that will be utilized will be the placement of silt fencing on the down gradient side of the site, the installation of "SiltSack" (proprietary) catch basin inlet protection during construction.

The proposed construction will take place in a highly urbanized setting and will require a detailed schedule of construction. Prior to the beginning of construction, the site contractor shall prepare a detailed schedule of construction and a construction phasing plan. The contractor shall provide an erosion control plan for each phase of construction for review and approval by the City of Portland Planning Authority. The erosion control plan shall be prepared in accordance with the Maine Department of Environmental Protection Best Management Practices for Sediment and Erosion control. The Erosion control plans prepared for each phase of construction shall include:

- Construction plans indicating the proposed construction phasing.
- Pre-development and post-development contours
- Plan scale and elements
- Land cover types and boundaries
- Critical areas
- Locations of controls
- Details and specifications for temporary and permanent controls

The erosion control plans prepared by the contractor shall meet the minimum requirements indicated in the following narrative:

A. Pre-construction Phase

Prior to the beginning of any construction, filter fabric fencing will be staked across the slope(s), on the contour, at or just below the limits of clearing or grubbing, and/or just above any adjacent property line or watercourse to protect against construction related erosion. The placement of silt fences shall be completed in accordance with guidelines established in best management practices and in accordance with the erosion control plan & details in the plan set. This network is to be maintained by the contractor until all exposed slopes have at least 85%-90% vigorous perennial vegetative cover and construction activity in the area has been completed.

Prior to any clearing, grubbing, stripping or pulverizing construction entrance(s) shall be constructed at the approved access points to the project site from the existing public roadway to avoid tracking of mud, dust and debris from the site.

Prior to construction, the contractor shall prepare a detailed schedule and marked up plan indicating areas and components of the work and key dates showing date of disturbance and completion of the work. The contractor shall schedule a pre-construction meeting with the municipal staff. Three copies of the schedule and marked up plan shall be provided to the municipality three days prior to the scheduled pre-construction meeting. Special attention shall be given to the 14 day limit of disturbance in the schedule addressing temporary and permanent vegetation measures.

The following erosion control measures shall be followed by the contractor throughout construction of this project.

B. Construction and Post-construction Phase

1.A) Areas undergoing actual construction shall only expose that amount of mineral soil necessary for progressive and efficient construction and shall not exceed 14 days. Areas that will not be completed (covered and/or finish graded) within fourteen (14) days of disturbance shall be anchored with temporary erosion control measures within fourteen (14) days of disturbance. Temporary erosion control shall include erosion control mesh, netting or mulch as directed by the inspecting engineer and as shown on the design plans. If mulch is used, hay or straw mulch shall be applied at the rate of 2 bales per 1,000 square feet. Application area shall be sufficiently covered with mulch to avoid any visible soil exposure. Mulch shall be kept moist to avoid loss due to wind. Mulch and netting shall be applied in the base of all grassed waterways (i.e., roadway ditches) and in slopes which exceed 15% and any disturbed areas within 100' of wetlands or streams.

B) If disturbed areas do not receive final seeding by September 15th of the year of construction, then all disturbed areas shall be seeded with a winter cover crop of rye at the rate of 3 lbs./1,000 s.f. to provide winter protection. Winter seedings shall be covered with erosion control mesh (mulch and netting). Heavy grade mats shall be used in the base of all grassed waterways, on slopes equal to or greater than 15%, and any disturbed areas within 100' of wetlands or streams. Mulch and netting shall also be applied for additional winter protection along side slopes of grassed waterways and in all areas equal to or greater than 8% slope.

C) During winter conditions, areas that will not be completed (covered and/or finish graded) within seven (7) days of disturbance shall be anchored with temporary erosion control measures within seven (7) days of disturbance. Temporary erosion control shall include erosion control mesh, netting or mulch as directed by the inspecting engineer and as shown on the design plans. If mulch is used, hay or straw mulch shall be applied to provide a minimum uniform mulch depth of 4". The application area shall be sufficiently covered with mulch to avoid any visible soil exposure.

2. All topsoil shall be collected, stockpiled, seeded with rye at 3 lbs./1,000 s.f. and mulched, and re-used as required. Siltation fencing shall be placed down gradient from stockpiled loam. Loam shall be stockpiled at locations designated by the owner and inspecting engineer.

3. All silt fences and erosion control measures shall be installed according to this plan. These shall be maintained during development to remove sediment from runoff water. All the silt fences and erosion control measures shall be inspected before and after any rainfall or runoff event, maintained and cleaned until all areas have at least 85%-90% vigorous perennial vegetative cover of grasses.

4. A construction entrance shall be built at the intersection of the existing road and the access drive. Roadway areas shall be periodically swept or washed to avoid tracking of mud, dust or debris from the construction area. Dust control during construction shall be achieved by the use of a watering truck to periodically sprinkle the exposed roadway areas as necessary to reduce dust during the dry months.

5. Catch basin inlet protection shall be placed within existing catch basins in the construction area prior to construction. Inlet protection for proposed catch basins shall be installed immediately following the installation of the outfall piping.

6. All areas shall be seeded and stabilized in accordance with the following vegetation plan.

C. Vegetation Plan

Revegetation measures shall commence immediately upon completion of construction of the roadway improvements. Disturbed areas shall also be mulched and anchored prior to any storm event. See mulching requirements in section b(1a) above. If final seeding cannot be accomplished by September 15th, then all disturbed areas shall be seeded with a winter cover crop of rye at the rate of 3 lbs./1,000 sq. Ft. To provide winter protection. Seeded areas shall be covered with erosion control mesh. See winter protection requirements in section b (1b) above.

Revegetation measures shall consist of the following:

1. Four inches of loam will be spread over disturbed areas and smoothed to a uniform surface. Loam shall be free of subsoil, clay lumps, stones and other objects over 1" in diameter, and without weeds, roots or other objectionable material.

2. Soils tests shall be taken at the time of soil stripping to determine fertilization requirements. Soils test shall be taken promptly as to not interfere with the 14 day limit on soil exposure. Based upon test results, soil amendments shall be incorporated into the soil prior to final seeding. In lieu of soil tests, soil amendments may be applied as follows:

Item	Application Rate
10-20-20 fertilizer (n-p205-k20 or equal	18.4 lb./1,000 sf
Ground limestone (50% Calcium + magnesium oxide)	138 lb./1,000 sf

3. Following seed bed preparation, swale areas, fill areas and back slopes shall be seeded at a rate of 3 lbs./1,000 s.f. with a mixture of 35% creeping red fescue, 6% red top, 24% Kentucky bluegrass, 10% perennial ryegrass, 20% annual ryegrass and 5% white Dutch clover.

4. Erosion control mesh shall be applied in accordance with the plans over all finish seeded areas as specified on the design plans.

5. All hay bale and/or filter fabric barriers will remain in place until seedings have become 85%-90% established and then removed within 10 days.

6. The inspecting engineer at his/her discretion, may require additional erosion control measures and/or supplemental vegetative provisions to maintain stability of earthworks and finish graded areas. The contractor shall be responsible for providing and installing any supplemental measures as directed by the inspecting engineer. Failure to comply with the engineer's directions will result in discontinuation of construction activities.

** Dates are subject to change at the discretion of the engineer, depending on construction progress.

D. Construction Schedule

Site improvements are scheduled to begin in spring of 2004. Construction duration is anticipated to be 36 months to time of substantial completion

SCHEDULE

1.*	Erosion Control Measures Placed	Week 1- Week 2
2.	Site Clearing and Grubbing	Month 1- Ongoing
3.	Construction of Site Improvements	Month1 - Month 18
4.	Mulch Spread for Winter Erosion Control	Oct. 15 of construction year
5.	Start Final Seedings on prepared areas (during growth season).	Month 15
6.	Biweekly Monitoring of Vegetative Growth.	Month 15
7.**	Re-seeding of areas, if needed	Month 15
8.**	Removal of erosion control devices.	Upon final project completion

** Note: Dates are subject to change at the discretion of the engineer, depending on construction progress.

E. **Inspections/Monitoring**

Inspections/monitoring maintenance measures shall be applied as needed during the entire construction cycle. After each rainfall, the contractor shall perform a visual inspection of all installed erosion control measures. The contractor shall perform repairs as needed to allow continued proper functioning of the erosion control measure. The contractor shall provide the municipality with written documentation describing dates of inspections and necessary follow-up work to maintain erosion control measures meeting the requirements of this plan. Following the temporary and/or final seedings, the contractor shall inspect the work area semimonthly until the seedings have been established. Established means a minimum of 85%-90% of areas vegetated with vigorous growth. Reseeding shall be carried out by the contractor with follow-up inspections in the event of any failures until vegetation is adequately established.

DLR:dlr/jc
December 15, 2003

Section 15

Groundwater

Groundwater

A. Narrative

1. Location

This development is not located over a sand and gravel aquifer. The proposed project is not located over a known fractured bedrock aquifer. (see enclosed map)

2. Quantity

No groundwater is to be used by the development. Water service will be supplied by municipal water.

3. Sources

This project will generate normal hospital waste including wastewater, solid waste, and medical waste. The project will be serviced by the City of Portland's Waste Water Treatment plant; therefore, subsurface sewage disposal will not be utilized.

4. Measures to Prevent Degradation

There will be no discharges to the groundwater by this project.

B. Groundwater Protection Plan

As the project consists solely of hospital use, no detrimental impact is anticipated on the groundwater and, therefore, no specific groundwater protection plan is provided.

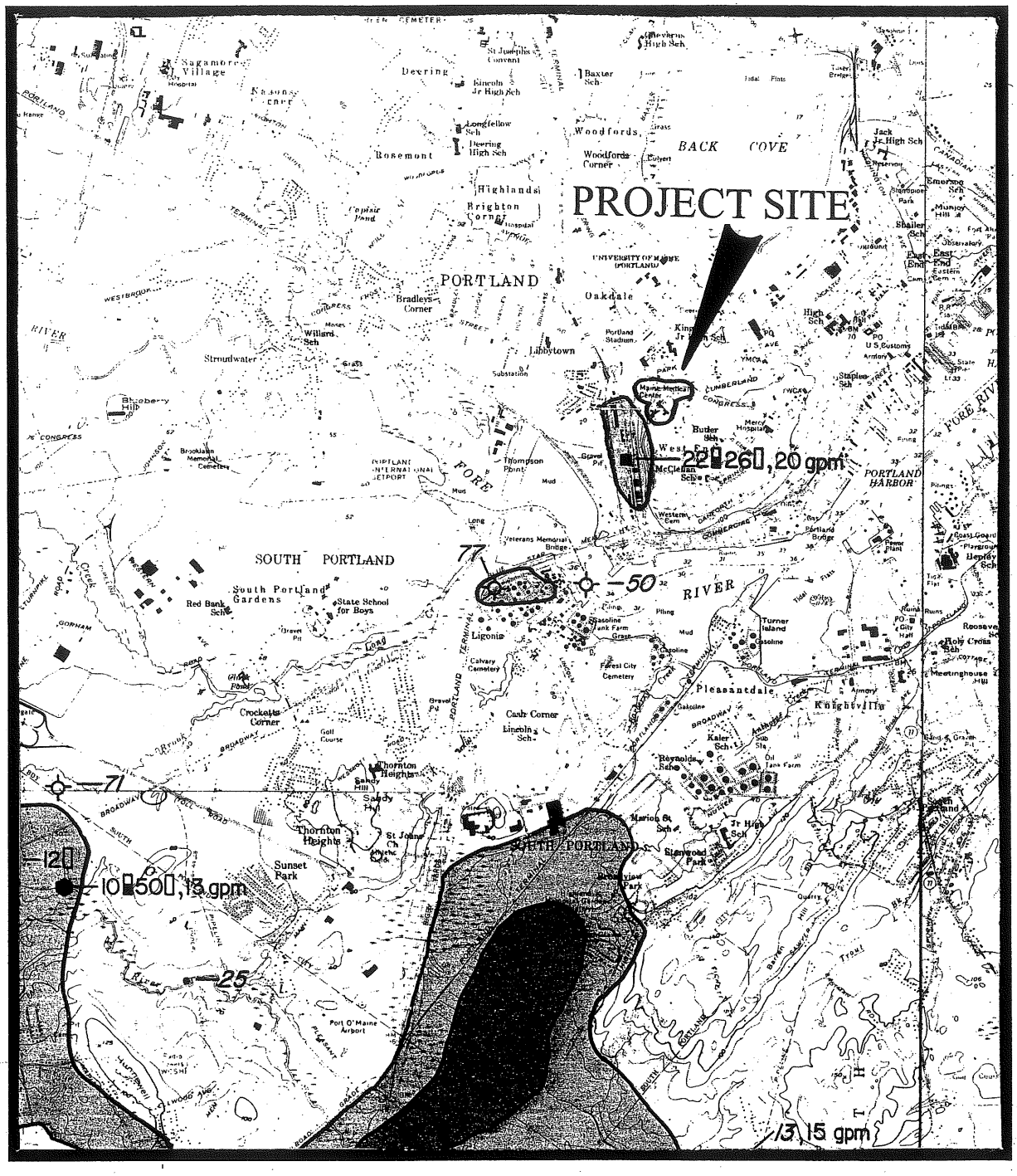
C. Monitoring Plan

Not applicable.

D. Monitoring Well Install Report

Not applicable.

FIGURE 3



SAND AND GRAVEL AQUIFER MAP

YORK AND CUMBERLAND COUNTIES, MAINE

SCALE 1=50,000

Sebago Technics

Engineering & Planning for the Future

Section 16

Water Supply

Water Supply

A. Off-Site Utility Company or Public Agency

The development will be serviced by municipal water supplied by the Portland Water District in accordance with the attached letter. Due to the re-alignment of Charles Street, various new water lines and service connections will be installed around the Maine Medical Center Campus to service the project. The attached plan set shows the proposed water line locations and service connection locations.

B. Subsurface Wastewater Disposal

Not applicable. The development will be serviced by municipal sewer.

C. Total Usage

Estimated water supply requirements for this project are 12,640 GPD from March to November, and 11,540 GPD from December through November.

Portland
Water District

225 Douglass St. • P.O. Box 3553 • Portland, ME 04104-355:
(207) 774-596
FAX (207) 761-830
www.pwd.or

November 20, 2003

Mr. Tony Panciocco
Sebago Technics, Inc.
One Chabot Street
Westbrook, Maine 04098-1339

Re: Maine Med Expansion, Portland

Dear Sir:

The Portland Water District has a 12" water main in Brackett Street, Portland, near the proposed site. A test on a nearby hydrant produced the following results: static pressure 54 psi; pito pressure 50 psi; with a flow of 949 gpm. With these results in mind, the District feels we have sufficient capacity available to serve this proposed project and meet all normal fire protection and domestic water service demands. **Please notify your plumber of these results so that they can design your system to best fit the available pressure**.

With certification by the developer that all required permits have been received, we look forward to serving this project.

Sincerely,

PORTLAND WATER DISTRICT

David W Coffin

David W. Coffin, PLS
Engineering Supervisor

Section 17

Wastewater Disposal

Wastewater Disposal

A. On-Site Subsurface Wastewater Disposal Systems

This project will be serviced by the municipal sewage disposal system.

B. Nitrate-Nitrogen Impact Assessment

As individual subsurface sewage disposal systems are not proposed for this development, a nitrate-nitrogen impact assessment is not needed.

C. Municipal Facility or Utility Company Letter

This project will be serviced by municipal sewer. We have sent a request for sewer service capacity to the City of Portland Public Works Department. Since the existing public system is a combined sanitary/storm system, we do not anticipate receiving an approval letter until our stormwater management plan has been reviewed by the Department. Their response letter will be forwarded once it has been received.

D. Wastewater Discharge Information

The proposed development will not discharge any liquid waste or sewage into any stream, river, pond, lake or other body of water.

E. Storage or Treatment Lagoons

The development proposal does not include any lagoons, impoundments, ponds, or similar studies for storage or treatment involving water or liquid waste other than solely stormwater.

Sebago Technics
Engineering to protect and sustain the built environment

sebagotechnics.com
One Chabot Street
P.O. Box 1339
Westbrook, Maine
04098-1339
Ph. 207-856-0277
Fax 856-2206

September 5, 2003
01046

Mr. Frank Brancely
Public Works Department
City of Portland
55 Portland Street
Portland, ME 04101

Request for Sewer Service Capacity Letter
Proposed Maine Medical, Central Utility Plant

Dear Mr. Brancely:

We are currently preparing a site plan application to the City of Portland for the above referenced project on the Maine Medical Center Campus on Bramhall Street. We are writing to request a letter to verify sewer service capacity for the proposed construction of a central utility plant for the campus. The Central Utility Plant project involves the construction of a 7,000 square foot building housing heating and cooling plant. The project is located along Gilman Street, east of the existing hospital building loading docks, and south of the existing Maine Medical Center parking garage. The plant will be located opposite "A" Street. Attached are concept plans for the project showing proposed utility locations.

Currently, sanitary sewers and storm drains from the existing L.L. Bean Building and western portion of the Maine Medical Center Campus are directed westerly to an existing manhole located in Gilman Street. These utilities will be relocated around the proposed Central Utility Plant. The relocated sewers will connect to the same manhole in Gilman Street as the existing site sewers. We will provide a sanitary manhole and a drain manhole at the property line to allow for future separation of the storm and sanitary flows.

Attached please find preliminary water usage/wastewater calculations for this project generated by the project architect, The Ritchie Organization. The attached calculations include current water usage for the existing hospital campus and the existing 13 Charles Street building. In addition, proposed water usage for both the Charles Street Project and the Central Utility Plant are included with the calculations. A separate request for sewer service capacity letter has been sent to you for the Charles Street Project. The figures below represent the increase in proposed usage due to the construction of the Central Utility Plant.

The proposed domestic water usage/waste water for the Central Utility plant is based on the following calculations:

Proposed Central Utility Plant	**Gallons/day**
March through November	= 1,610 g/day
December through November	= 510 g/day

We are currently preparing plans for a September 23, 2003 Planning Board Workshop submittal and anticipate moving forward with the final design following that meeting. We will submit final design drawings, including a profile of the proposed sanitary lines, to you for review as soon as they are completed. In the interim, we will be happy to meet with you to discuss the project in more detail.

Thank you for your response to this request. If you have any questions or require additional information, please contact me.

Sincerely,

SEBAGO TECHNICS, INC.

Daniel L. Riley, PE
Project Manager

DLR:ap/jc/dlf
Enc.

Section 18

Solid Waste

Solid Waste

A. Estimated Quantities of Solid Waste

Currently, the site generates both solid waste and medical waste typical of any hospital. Three on-site dumpsters, located just beyond the L. L. Bean underpass on the hospital access road, handle the solid waste disposal for the hospital. A subcontractor picks up medical waste from the hospital three times a week. Additional waste generated by the development of the site will be handled in the same manner. All waste will be transported to the L. L. Bean Building via the proposed service tunnel and removed from the campus either through the use of the existing dumpsters or the medical waste subcontractor. The hospital will coordinate with their subcontractors should additional removal times be required to handle the additional waste generated by the development.

B. Off-Site Disposal of Construction/Demolition Debris

At the time of this application, a demolition contractor has not yet been selected for the project. Once a contractor has been selected, requirements for this subsection will be forwarded.

C. On-site Disposal of Wood Waste/Land Clearing Debris

Required tree clearing will be performed by a qualified tree cutter and the logs taken off site. The associated stumps and grubbing will be ground on site by a portable stump grinder and used as mulch in the stabilization of back slopes and for erosion control. We do not anticipate the on-site burning of wood waste for this project.

D. Special or Hazardous Waste

The proposed hospital addition is expected to generate biomedical (red bag) waste. This waste will be collected by the hospital's current disposal contractor and disposed of at an approved disposal facility.

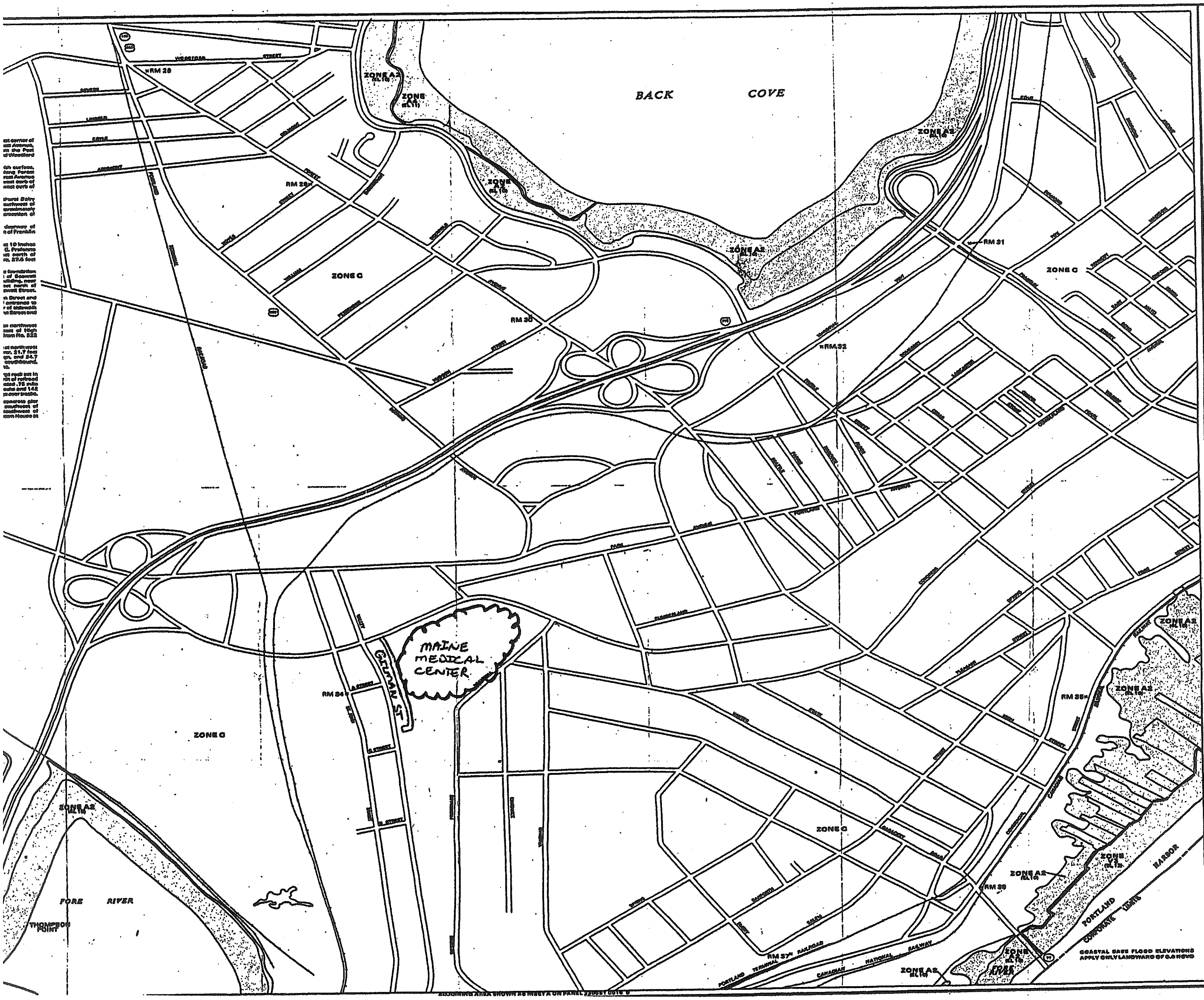
Section 19

Flooding

Section 19

Flooding

This project is not located within a 100-year flood plain (see attached Federal Emergency Management Agency Flood Zone Map).



KEY TO MAP

*EXPLANATION OF ZONE DESIGNATIONS

EXPLANATION

NOTES TO USER

INITIAL IDENTIFICATION:
APRIL 29, 1977

FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 17, 1986

FLOOD INSURANCE RATE MAP REVISIONS:

APPROXIMATE SCALE

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

Section 20

Blasting

Blasting

No blasting is anticipated in order to construct the infrastructure or buildings for the proposed development.

Section 21

Air Emissions

Section 21

Air Emissions

This project will not generate any point sources other than the stack serving the Central Utility Plant. Non-point sources will be restricted to vehicular traffic accessing the hospital. This project may require Maine Medical Center to modify its current air emissions license.

Section 22

Odors

Section 22

Odors

This development proposal consists solely of a hospital development and will not create any significant odors.

Section 23

Water Vapor

Section 23

Water Vapor

This hospital development will not generate water vapor emissions which would cause a change in the local climate.

Section 24

Sunlight

Section 24

Sunlight

The proposed building heights limit the potential to adversely impact sunlight access on abutting properties associated with this development proposal as depicted on the following sun/shadow studies.

(EX) JUNE 21 9AM

Name: 4673Shadows_Exst-06 21-0900.tif

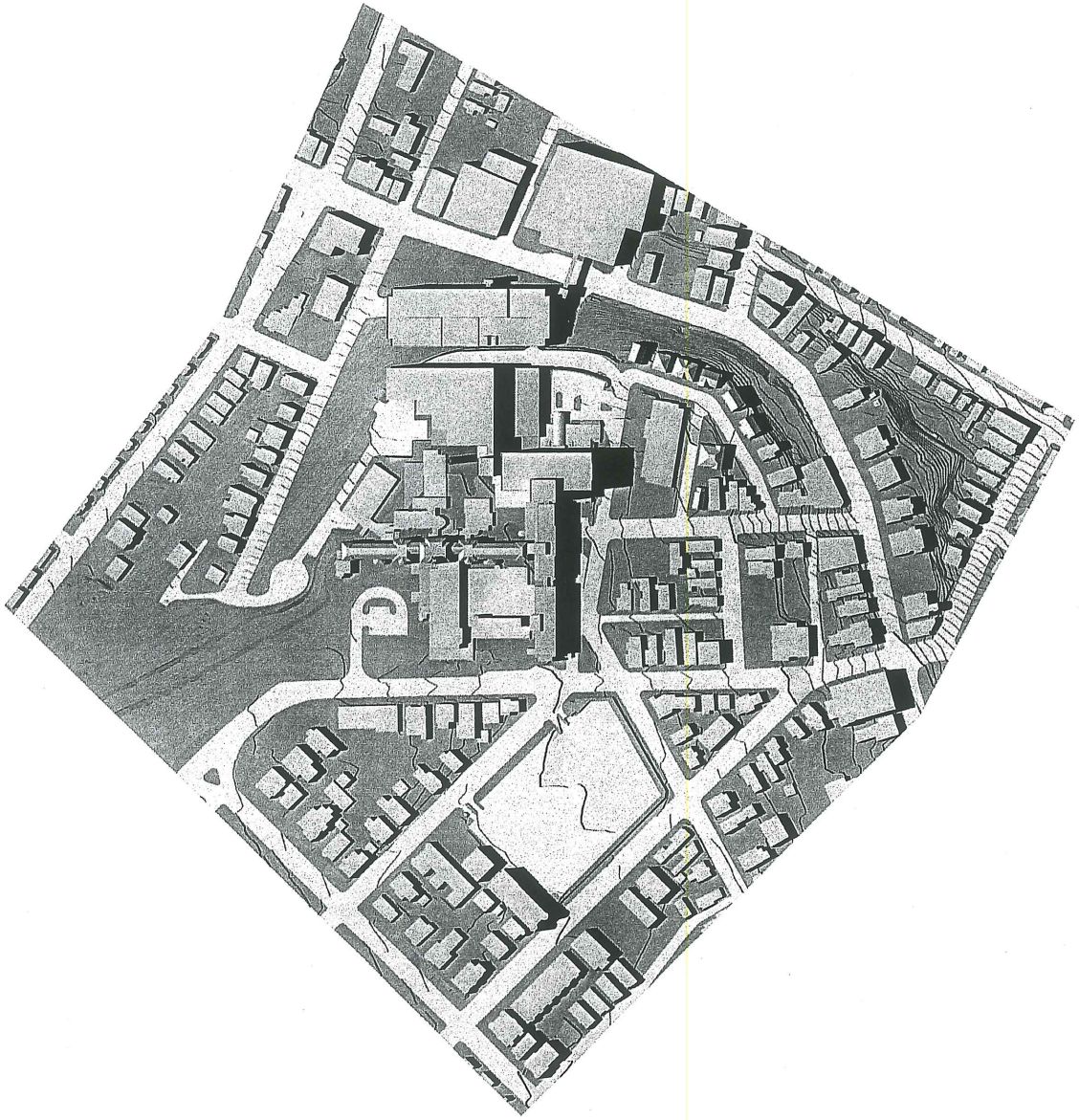
TRO

(EX) JUNE 21 12 NOON

Name: 4673Shadows_Exst-06 21-1200.tif

TRO

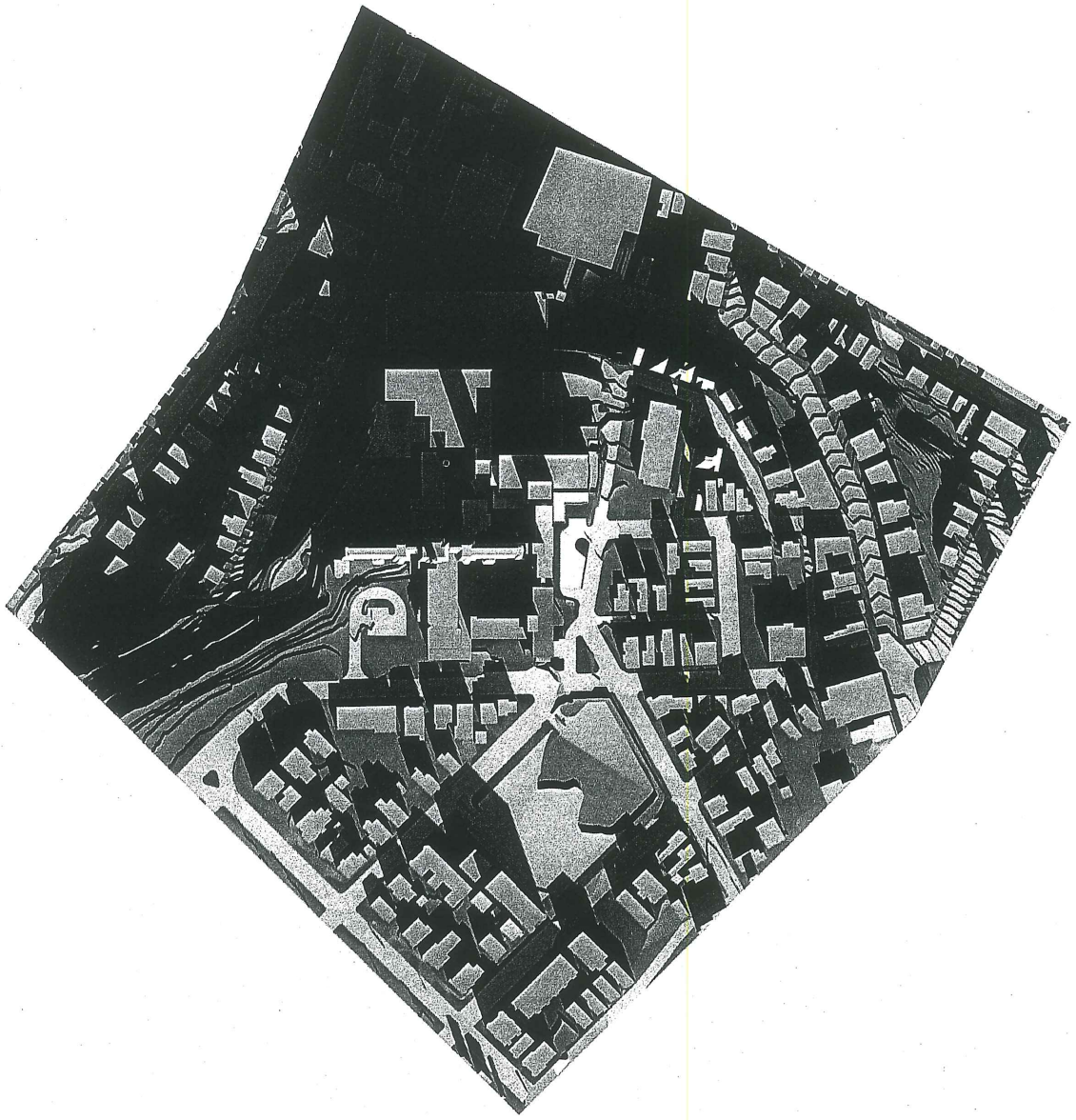
(EX) JUNE 21 3PM



Name: 4673Shadows_Exst-06 21-1500.tif

TRD

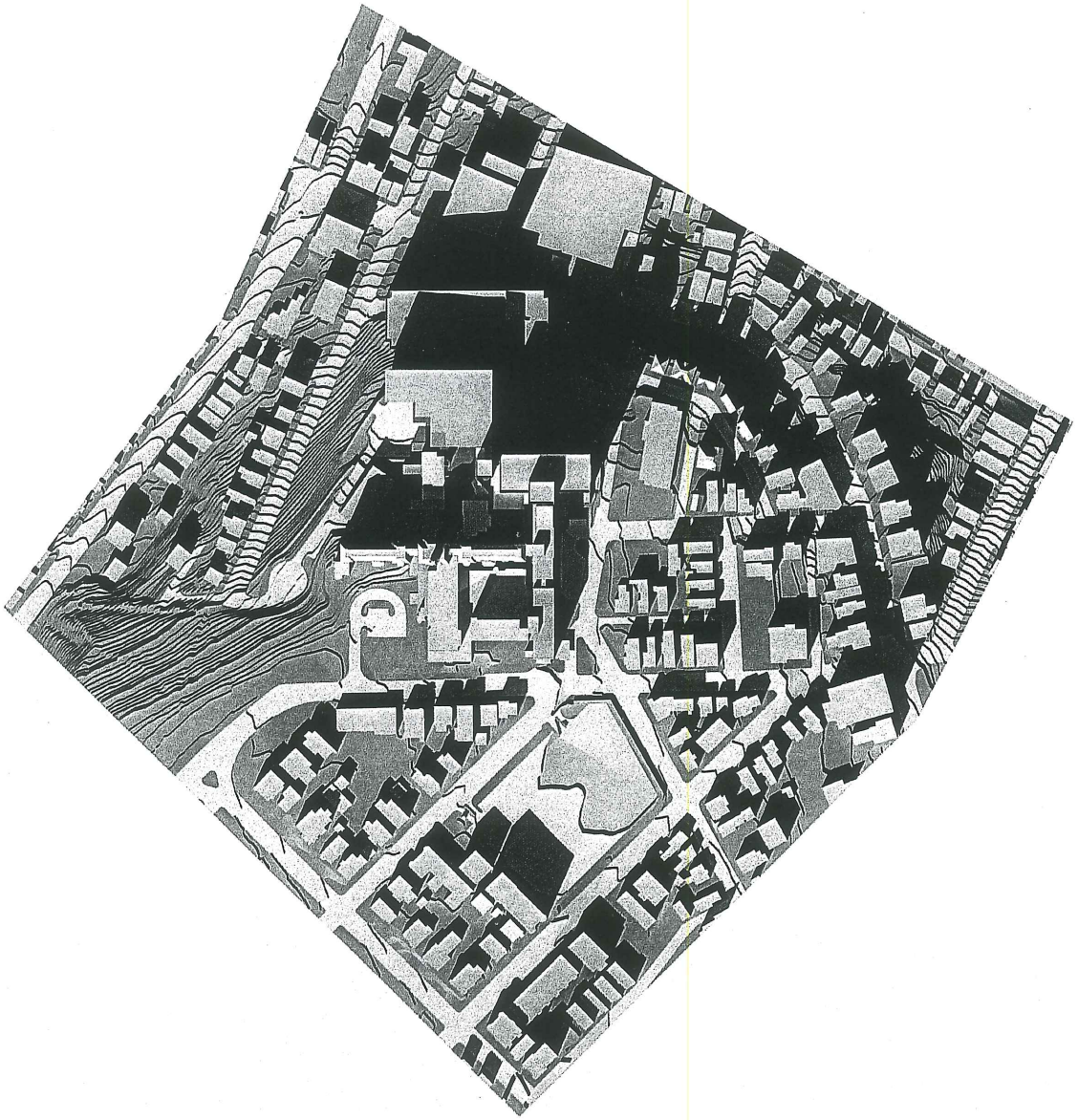
(EX) DECEMBER 21 9AM



Name: 4673Shadows_Exst-12 21-0900.tif

TRD

(EX) DECEMBER 21 NOON



Name: 4673Shadows_Exst-12 21-1200.tif

TBO

(EX) DECEMBER 21 3 PM

Name: 4673Shadows_Exst-12 21-1500.tif

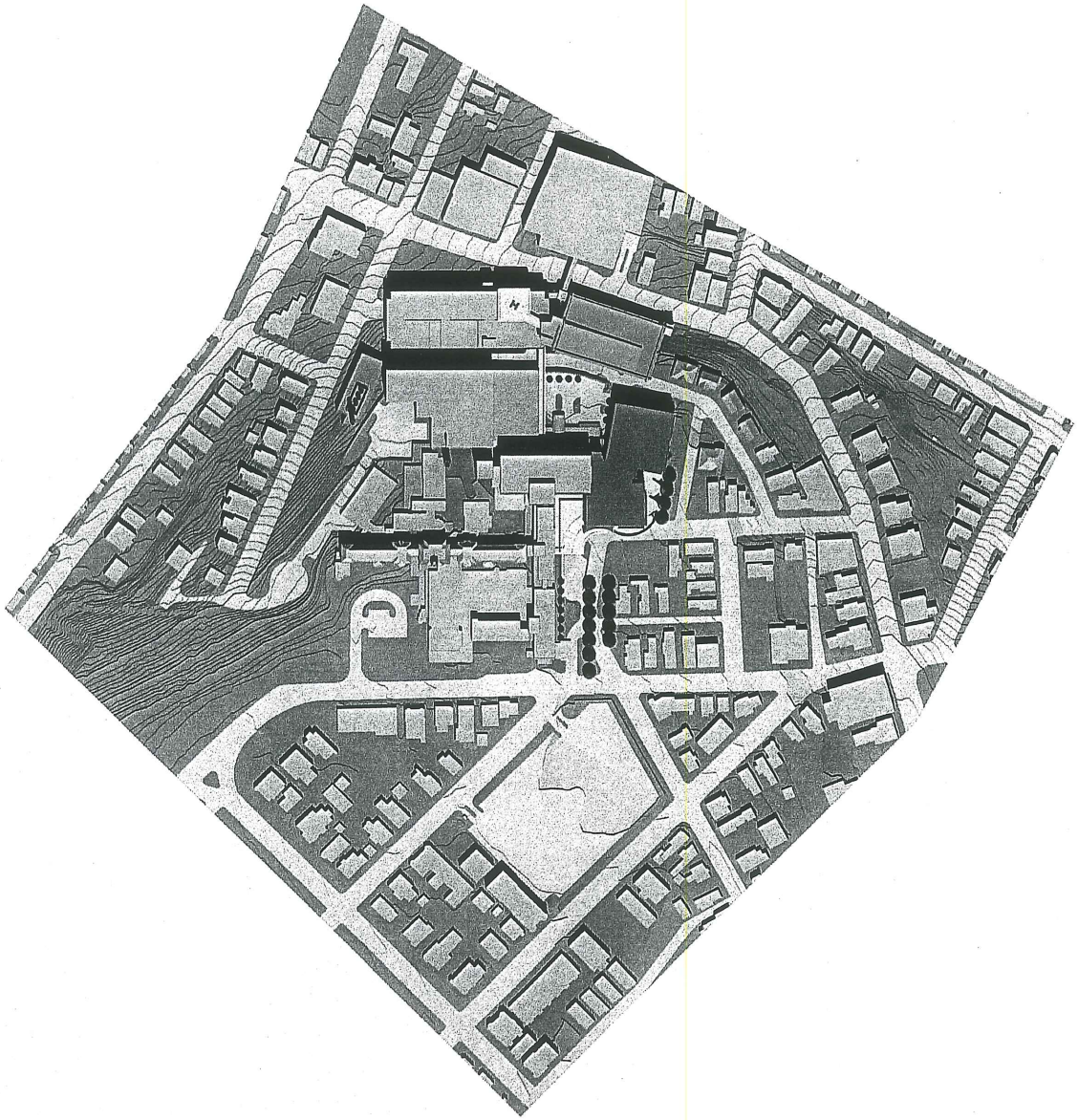
TRO

(NEW) JUNE 21 9 AM

Name: 4673Shadows_New-06 21-0900.tif

TCO

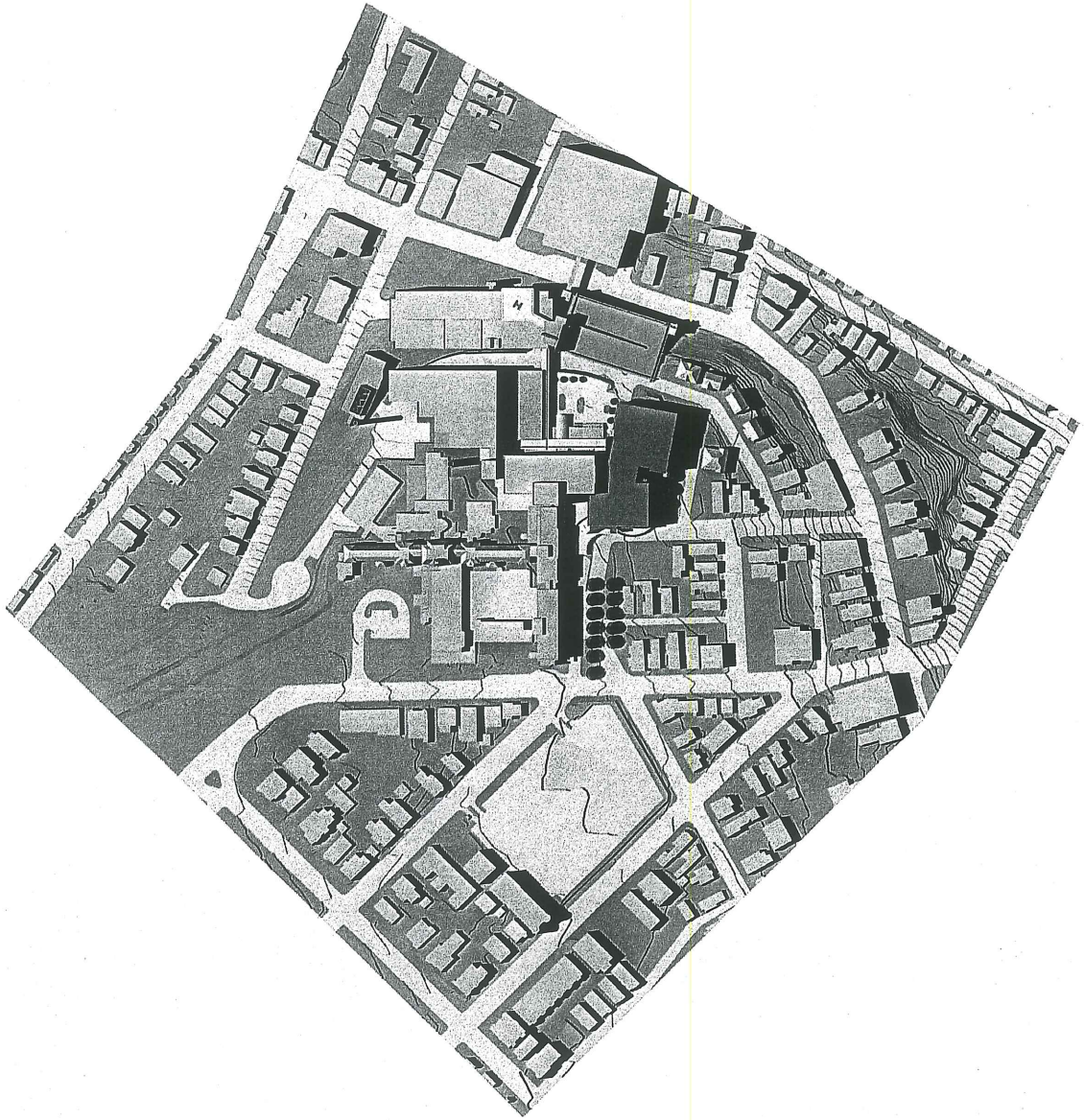
(NEW) JUNE 21 NOON



Name: 4673Shadows_New-06 21-1200.tif

TBD

(NEW) JUNE 21 3 PM



Name: 4673Shadows_New-06 21-1500.tif

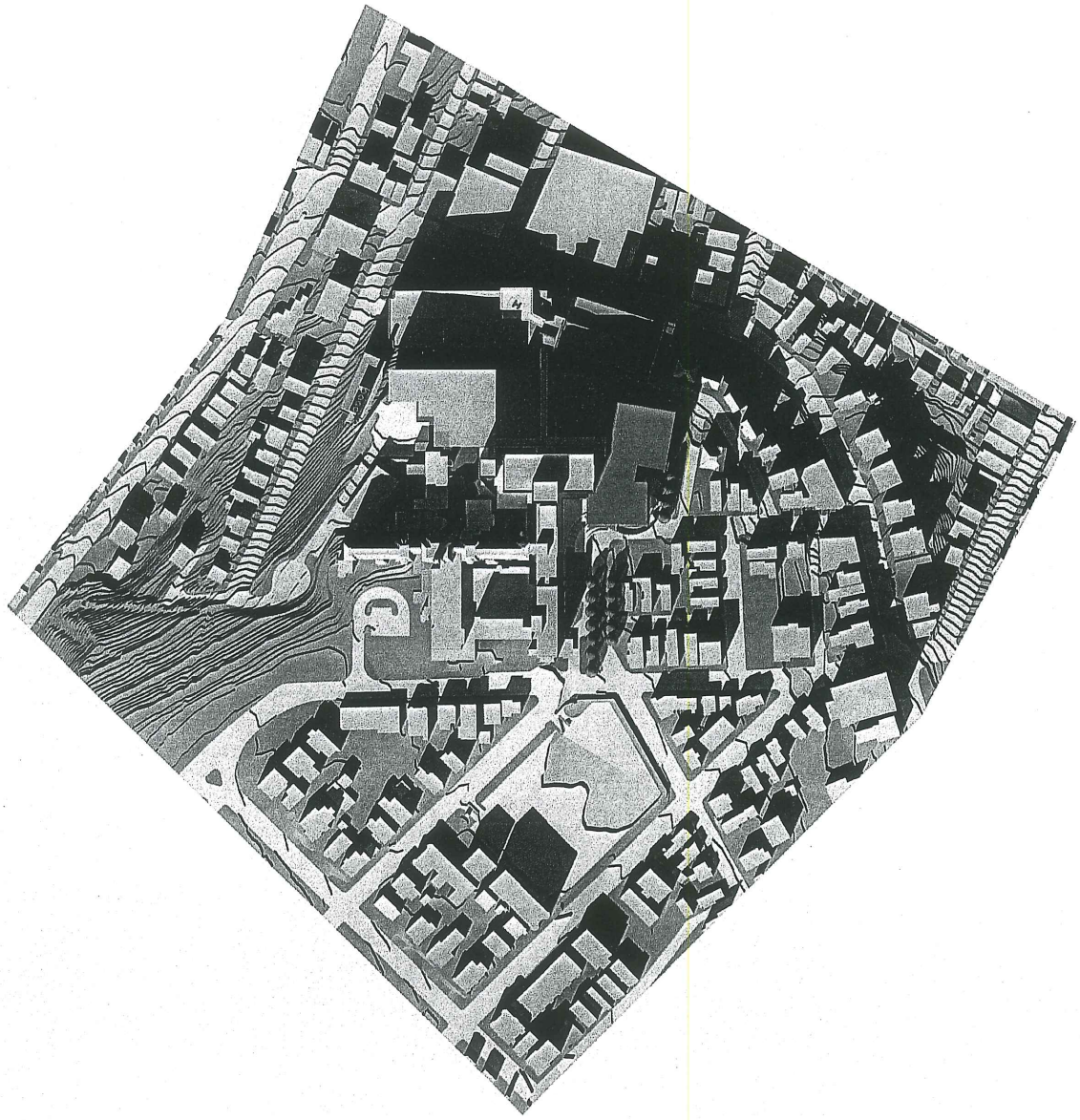
TRO

(NEW) DECEMBER 21 9 AM

Name: 4673Shadows_New-12 21-0900.tif

TRD

(NEW) DECEMBER 21 NOON



Name: 4673Shadows_New-12 21-1200.tif

TRO

(NEW) DECEMBER 21 3PM

Name: 4673Shadows_New-12 21-1500.tif

TRD

Section 25

Notices

Notices

A. The City of Portland will notify the abutters of activities within the area of the project site. We also understand that we will be billed for mailings to the abutters.