

STORMWATER MANAGEMENT STATEMENT

То:	Township of Nutley Zoning Board of Adjustment
Project:	Proposed Parking Lot and Associated Site Improvements 371 North Franklin Ave
	Block 4602, Lots 20 & 24
	Township of Nutley, Essex County, New Jersey
Dated:	Created on May 13, 2020
Reference:	<u>Preliminary & Final Major Site Plans</u> , prepared by Stonefield Engineering & Design, LLC Dated: May 13, 2020

The Applicant is proposing interior renovations to the existing building to convert it to a mixed use building with both a drive in restaurant and a bank use on the first floor and the second and third floors being designated for office use. There will be no addition to the existing building footprint. Exterior renovations to the site include parking, lighting and landscape improvements which consist of a decrease of 1,192 SF in impervious coverage. The subject property is designated as Block 4602, Lot 20, commonly known as 371 North Franklin Avenue. The site fronts Franklin Avenue to the east, Chestnut Street 230 FT to the south, and abuts commercial uses to the north. The purpose of this statement is to assess the stormwater management impacts associated with the proposed improvements.

The total project area is 43,916 Sf (1.01 AC) of which 32,010 SF will be disturbed. Under existing conditions, the site exceeds the maximum allowable coverage by 3,279 SF (7.5%). The proposed improvements will reduce the impervious coverage on-site by 1,192 SF bringing the site down to 2,087 SF in excess of the maximum allowable coverage.

PRE-DEVELOPMENT DRAINAGE CONDITIONS

The total site area is 43,915 SF and is currently occupied by a three-story mixed use commercial building. General slopes on the site are moderate ranging between 0% - 8%. Under existing conditions, the runoff sheet flow is collected through trench drains and is routed from the property into a catch basin in the Municipal Right-of-Way. The following table summarizes the existing drainage area 'E-1' utilized in the stormwater analysis.

TABLE I: Pre-Development Drainage Area

Drainage Area	Description	Area Extents Imperviou Area		Impervious Coverage	Time of Concentration
E-I	Existing Drainage Area	43,916 SF	42,782 SF	97.5%	10 Minutes



PROPOSED DRAINAGE CONDITIONS

The project proposes to upgrade the existing parking lot and associated site improvements to facilitate the new tenants operations. The existing drainage patterns will remain the same throughout the site where runoff will sheet flow toward North Franklin Avenue until it is intercepted by exiting trench drains. The runoff will ultimately be conveyed off-site, into the County right-of-way. The improvements will reduce the total impervious coverage on-site which will lead to an overall reduction runoff volume and peak discharge rates. The following table summarizes the drainage area P-1 utilized in the stormwater analysis:

TABLE 2: Post-Development Drainage Area

Drainage Area	Description	Area Extents Impervious Area		Impervious Coverage	Time of Concentration
P-1	Proposed Drainage Area	43,916 SF	41,590 SF	94.7%	10 Minutes

STORMWATER MANAGEMENT ANALYSIS

As the site improvements <u>do not</u> propose to disturb more than once acre of land and <u>do not</u> propose to increase impervious coverage by more than one-quarter acre, the project <u>is not</u> defined as a major development. The design intent of this project is meet the Municipal regulations for groundwater recharge, water quality, and water quantity. To this end, the calculations contained within this Statement will demonstrate that:

Groundwater Recharge: The site will naturally provide additional groundwater recharge via the reduction of impervious coverage. Refer to the table below for the overall stormwater volume reduction in post development conditions.

Water Quality: Water quality is not required for minor developments. However, the site will naturally provide additional runoff quality via the reduction of impervious coverage.

Water Quantity: The calculations will demonstrate through hydrologic and hydraulic analysis that the events will not exacerbate pre-construction peak runoff rates.

TABLE 3: STORMWATER ANALYSIS SUMMARY

Storm Event	Pre-Development Peak Discharge	Post-Development Peak Discharge	Pre-Development Runoff Volume	Post-Development Runoff Volume
2-Year	2.69 CFS	2.65 CFS	11,039 CF	10,844 CF
10-Year	4.12 CFS	4.07 CFS	17,169 CF	16,930 CF
25-Year	5.10 CFS	5.05 CFS	21,389 CF	21,131 CF
100-Year	6.86 CFS	6.81 CFS	29,007 CF	28,723 CF



Stormwater Management Statement 371 North Franklin Avenue Township of Nutley, New Jersey May 13, 2020

The development will maintain the drainage area patterns from the pre-development conditions. No adverse impacts to the Borough conveyance system are anticipated as a result of the project. Detailed hydraulic calculations can be found in the Appendix of this statement.

Prepared by:

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Jonathan Istranyi, PE, PP, CME, CFM NJ PE License No. 46719 **Stonefield Engineering and Design, LLC**

APPENDIX A NRCS SOILS REPORT



United States Department of Agriculture

Natural Resources Conservation

Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Essex County, New Jersey



Custom Soil Resource Report Soil Map



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
URDUNB	Urban land, Dunellen substratum, 0 to 8 percent slopes	0.6	62.4%
USBOOB	Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 0 to 8 percent slopes	0.4	37.6%
Totals for Area of Interest	•	1.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, New Jersey

URDUNB—Urban land, Dunellen substratum, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9d5 Elevation: 50 to 150 feet Mean annual precipitation: 30 to 64 inches Mean annual air temperature: 46 to 79 degrees F Frost-free period: 131 to 178 days Farmland classification: Not prime farmland

Map Unit Composition

Urban land, dunellen substratum: 90 percent Minor components: 10 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Dunellen Substratum

Setting

Landform: Outwash plains Landform position (three-dimensional): Lower third of mountainflank Down-slope shape: Linear Across-slope shape: Linear Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material H2 - 12 to 31 inches: sandy loam 2C - 31 to 42 inches: sandy loam 3C - 42 to 70 inches: loamy sand

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8s Hydric soil rating: Unranked

Minor Components

Udorthents, dunellen substratum

Percent of map unit: 5 percent Landform: Outwash plains Landform position (three-dimensional): Lower third of mountainflank Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Dunellen

Percent of map unit: 5 percent Landform: Outwash plains Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

USBOOB—Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9c3 Mean annual precipitation: 30 to 64 inches Mean annual air temperature: 46 to 79 degrees F Frost-free period: 131 to 178 days Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton red sandstone lowland substratum: 60 percent *Boonton, red sandstone lowland, and similar soils:* 30 percent *Minor components:* 10 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Urban Land, Boonton Red Sandstone Lowland Substratum

Setting

Landform: Ground moraines Landform position (three-dimensional): Lower third of mountainflank Down-slope shape: Linear Across-slope shape: Linear Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material
H2 - 12 to 67 inches: gravelly loam
2CB - 67 to 83 inches: gravelly sandy loam

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8s Hydric soil rating: Unranked

Description of Boonton, Red Sandstone Lowland

Setting

Landform: Ground moraines Down-slope shape: Convex Across-slope shape: Linear Parent material: Coarse-loamy till derived from sandstone and shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material *A - 1 to 3 inches:* silt loam *BE - 3 to 10 inches:* loam *Bw - 10 to 27 inches:* gravelly loam *Bx1 - 27 to 40 inches:* gravelly fine sandy loam *Bx2 - 40 to 67 inches:* gravelly fine sandy loam *BCx - 67 to 83 inches:* gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2e Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Udorthents, boonton red sandstone lowland substratum

Percent of map unit: 10 percent Landform: Ground moraines Landform position (three-dimensional): Lower third of mountainflank Down-slope shape: Convex Across-slope shape: Linear Hydric soil rating: No

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APPENDIX B HYDROCAD DATA & ANALYSIS RESULTS



Area Listing (all nodes)

Area	CN	Description
(sq-ft)		(subcatchment-numbers)
3,460	74	>75% Grass cover, Good, HSG C (E-1, P-1)
84,372	98	Impervious Surfaces (E-1, P-1)

Summary for Subcatchment E-1: Existing Drainage

Runoff = 2.69 cfs @ 12.17 hrs, Volume= 11,039 cf, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 2 YR Rainfall=3.30"

	Area (sf)	CN	Description					
*	42,782	98	Impervious	npervious Surfaces				
	1,134	74	>75% Gras	75% Grass cover, Good, HSG C				
	43,916	97	Weighted A	/eighted Average				
	1,134	74	2.58% Perv	2.58% Pervious Area				
	42,782	98	97.42% Impervious Area					
mi)	Гс Length n) (feet)	Slop (ft/f	e Velocity t) (ft/sec)	Capacity (cfs)	Description			
10	.0				Direct Entry, Direct			

Subcatchment E-1: Existing Drainage



Summary for Subcatchment P-1: Proposed Drainage

Runoff = 2.65 cfs @ 12.17 hrs, Volume= 10,844 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 2 YR Rainfall=3.30"

	Area (sf)	CN	Description					
*	41,590	98	Impervious	mpervious Surfaces				
	2,326	74	>75% Gras	s cover, Go	bod, HSG C			
	43,916	97	Weighted A	Weighted Average				
	2,326	74	5.30% Perv	5.30% Pervious Area				
	41,590	98	94.70% Imp	pervious Are	ea			
	Tc Length	Slop	e Velocity	Capacity	Description			
	(min) (feet)	(ft/1	ft) (ft/sec)	(cfs)				
	10.0				Direct Entry, Direct			

Subcatchment P-1: Proposed Drainage



Summary for Subcatchment E-1: Existing Drainage

Runoff = 4.12 cfs @ 12.17 hrs, Volume= 17,169 cf, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 10 YR Rainfall=4.99"

	Area (sf)	CN	Description					
*	42,782	98	Impervious	mpervious Surfaces				
	1,134	74	>75% Grass	75% Grass cover, Good, HSG C				
	43,916	97	Weighted A	/eighted Average				
	1,134	74	2.58% Perv	2.58% Pervious Area				
	42,782	98	97.42% Imp	97.42% Impervious Area				
		~		• ••				
	Ic Length	Slop	e Velocity	Capacity	Description			
(min) (feet)	(ft/1	t) (ft/sec)	(cfs)				
	10.0				Direct Entry, Direct			

Subcatchment E-1: Existing Drainage



Summary for Subcatchment P-1: Proposed Drainage

Runoff = 4.07 cfs @ 12.17 hrs, Volume= 16,930 cf, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 10 YR Rainfall=4.99"

	Area (sf)	CN	Description	Description					
*	41,590	98	Impervious	mpervious Surfaces					
	2,326	74	>75% Grass	75% Grass cover, Good, HSG C					
	43,916	97	Weighted A	/eighted Average					
	2,326	74	5.30% Perv	5.30% Pervious Area					
	41,590	98	94.70% Imp	94.70% Impervious Area					
				- ··					
	Tc Length	Slop	e Velocity	Capacity	Description				
(r	min) (feet)	(ft/1	t) (ft/sec)	(cfs)					
	10.0				Direct Entry, Direct				

Subcatchment P-1: Proposed Drainage



Summary for Subcatchment E-1: Existing Drainage

Runoff = 6.86 cfs @ 12.17 hrs, Volume= 29,007 cf, Depth= 7.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 100 YR Rainfall=8.24"

	Area (sf)	CN	Description	Description					
*	42,782	98	Impervious	npervious Surfaces					
	1,134	74	>75% Gras	75% Grass cover, Good, HSG C					
	43,916	97	Weighted A	Veighted Average					
	1,134	74	2.58% Perv	2.58% Pervious Area					
	42,782	98	97.42% Imp	97.42% Impervious Area					
	Tc Length	Slop	e Velocity	Capacity	Description				
(min) (feet)	(ft/1	t) (ft/sec)	(cfs)					
	10.0				Direct Entry, Direct				

Subcatchment E-1: Existing Drainage



Summary for Subcatchment P-1: Proposed Drainage

Runoff = 6.81 cfs @ 12.17 hrs, Volume= 28,723 cf, Depth= 7.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs NOAA 24-hr D 100 YR Rainfall=8.24"

Area (sf)	CN	Description						
41,590	98	Impervious	npervious Surfaces					
2,326	74	>75% Gras	75% Grass cover, Good, HSG C					
43,916	97	Weighted A	/eighted Average					
2,326	74	5.30% Perv	5.30% Pervious Area					
41,590	98	94.70% Impervious Area						
Tc Length	Slop	e Velocity	Capacity	Description				
n) (feet)	(ft/f	t) (ft/sec)	(cfs)					
.0				Direct Entry, Direct				
	Area (sf) 41,590 2,326 43,916 2,326 41,590 Tc Length n) (feet) .0	Area (sf) CN 41,590 98 2,326 74 43,916 97 2,326 74 41,590 98 Tc Length Slop n) (feet) (ft/f	Area (sf) CN Description 41,590 98 Impervious 2,326 74 >75% Gras 43,916 97 Weighted A 2,326 74 5.30% Perv 41,590 98 94.70% Imp Tc Length Slope Velocity n) (feet) (ft/ft) (ft/sec)	Area (sf)CNDescription41,59098Impervious Surfaces2,32674>75% Grass cover, Grass c				

Subcatchment P-1: Proposed Drainage



APPENDIX C-I HYDRAFLOW ROUTING DIAGRAM



APPENDIX C-2 PIPE CONVEYANCE SUMMARY

SED

Line No.	Line ID	Invert Dn	Invert Up	Line Size	Line Slope	Flow Rate	Vel Dn	Capac Full	HGL Dn	HGL Up	Drng Area	Тс	i Inlet	n-val Pipe	Gnd/Rim El Dn	Gnd/Rim El Up	Line Length	
		(ft)	(ft)	(in)	(%)	(cfs)	(ft/s)	(cfs)	(ft)	(ft)	(ac)	(min)	(in/hr)		(ft)	(ft)	(ft)	
1	EX1 - D100	79.50	80.66	8	4.00	0.76	3.37	2.62	79.91	81.07	0.13	10.0	6.07	0.012	84.50	84.74	29.0	
2	EX1 - D101	79.50	79.74	6	2.00	0.08	1.82	0.86	79.64	79.88	0.00	10.6	0.00	0.012	84.50	84.00	12.0	
3	D101 - D102	79.74	80.22	6	2.00	0.08	1.82	0.86	79.88	80.36	0.00	10.4	0.00	0.012	84.00	84.00	24.0	
4	D102 - D103	80.22	80.70	6	2.00	0.08	1.82	0.86	80.36	80.84	0.00	10.2	0.00	0.012	84.00	84.00	24.0	
5	D103 - D104	80.70	81.10	6	2.00	0.08	1.83	0.86	80.84	81.24	0.02	10.0	6.07	0.012	84.00	84.29	20.0	
2020-04-13_Pipe Sizing							N	Number of lines: 5 Date: 4/14/2020			:020							
NOTE	S: Intensity = 54.20) / (Inlet tin	ne + 9.20)	^ 0.74	- Return (period = 2	25 Yrs. ;	** Critica	l depth			I				I		

APPENDIX C-3 PIPE PROFILE



Storm Sewers









APPENDIX D DRAINAGE AREA MAPS



•				OR MUNICIPAL SUBMISSION	DESCRIPTION
DESCRIPTION				SS	ВΥ
PROPERTY LINE EXISTING SITE DRAINAGE AREA EXISTING PERVIOUS AREA				02/03/2020	DATE
				10	ISSUE
		engineering & design	Rutherford, NJ • New York, NY Princeton, NJ • Tampa, FL • Detroit, MI	www.stonefieldeng.com	Headquarters: 92 Park Avenue, Rutherford, NJ 07070 Phone 201.340.4468 · Fax 201.340.4472
	DRAINAGE AREA MAPS	PROPOSED PARKING LOT AND ASSOCIATED SITE IMPROVEMENTS		BLOCK 4602, LOTS 20 & 24	31 NORTH RANKLIN AYENUE TOWNSHIP OF NUTELY ESSEX COUNTY, NEW JERSEY
		CHARLES NEW JERSEY LICENSED PRO	D. OLI LICENSE 1 FESSIONAL	VO, P.I No. 46719 ENGINEE	
	500		ROV		DR I
	PRO	JECT ID.	т.	- 30'	,
			DNE	EFI	ELD
60'		.E: FXISTING			CF

SHEET:

I OF 2



30'

0'

GRAPHIC SCALE IN FEET

I" = 30'









				FOR MUNICIPAL SUBMISSION	DESCRIPTION					
<u> </u>	┝			so ss	BY					
REA				02/03/20	DATE					
				10	ISSUE					
		engineering & design	Rutherford, NJ · New York, NY Princeton, NJ · Tampa, FL · Detroit, MI	www.stonefieldeng.com	Headquarters: 92 Park Avenue, Rutherford, NJ 07070 Phone 201.340.4468 · Fax 201.340.4472					
	DRAINAGE AREA MAPS	PROPOSED PARKING LOT AND ASSOCIATED SITE IMPROVEMENTS		BLOCK 460, LOTS 20 & 24 31 LOTS 20 & 24 TOWNSHIP OF NUTELY ESSEX COUNTY, NEW JERSEY						
60'	CHARLES D. OLIVO, P.E. NEW JEST LICENS No. 4/19 LICENSE PROFESSIONAL BIOMER NOT APPROVED FOR CONSTRUCTION SCALE: (H) I" = 30' PROJECT ID: T-18177 Construction STONEFIELD Contraction Science Construction SCALE: (H) IT = 30' PROJECT ID: T-18177 TITLE: PROPOSED DRAINAGE									
	PROPOSED DRAINAGE AREA MAP SHEET: 2 OF 2									





DESCRIPTION PROPERTY LINE

PROPOSED SITE DRAINAGE AREA

PROPOSED PERVIOUS AREA

11				
SCALE: (H)				
PROJECT ID:				
TITLE:	60'	30'	0'	
PROPOSED AREA				
SHEET: 2 O		le in feet 80'	GRAPHIC SCAI	