



Existing Construction Conditions & Technical Assignment 2

By Anthony Lucostic

Contents

Executive Summary
Detailed Project Schedule
Site Layout Planning
Assemblies Estimate
Detailed Superstructure Estimate
General Conditions Estimate

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Executive Summary

The contents of this report capture a more in depth look at the Food Science Building's schedule, site plan, estimates and general conditions. The detailed project schedule looks closely at the procedure of constructing the building including durations and linking activities. It begins with excavation, sitework, piles and concrete then continues to proceed with the structural steel, building envelope, and interiors. A crucial part of the building in the schedule is the Production Area of the building and Creamery Sales Area which are definitely the driving forces behind completing the project on schedule. The following site layout plans depict the project from all views showing the overall layout of the site with the surrounding features. The site plans then become more detailed on the Food Science Project itself looking at utilities, site logistics, and the structural steel erection sequence of the project. Next, there is an assemblies estimate of the fire protection system of the building. The Food Science Building is mostly all a wet sprinkler system but there is a small portion of the system in the Production Area that is dry; these costs are separated and shown on the summary and take-offs. The estimate I created is approximately \$18,000 dollars shy of the actual cost of the fire protection package on the project. The main conflict here is that there was a \$10,000 dollar add for misc. metal support to the contract at bid time. Following this is a detailed estimate of the entire Food Science Building's superstructure including piles, concrete, and structural steel. Finally, is a general conditions estimate that was put together from Cost Works 2005. The estimate I created for this ended up being approximately \$1.1 million dollars shy of the typical 10% cost of the project for general conditions. I feel the main reason for this is because a lot of the temporary facilities and equipment costs were written into the subcontractors scope of work and was not part of the construction managers general conditions. The entire report gives a more in depth look at the Food Science Building than the previous technical assignment 1.

Food Science Building

October 31, 2005

Activity Name	Start	Finish	J F M A M J J A S O N D												J F M A M J J A											
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A				
Food Science	03-Jan-05	01-Aug-06	01-A																							
Sitework East	03-Jan-05	25-Apr-05	Sitework East																							
Sitework West	28-Feb-05	26-Jul-05	Sitework West																							
Piles East	31-Jan-05	25-Mar-05	Piles East																							
Piles West	14-Mar-05	23-May-05	Piles West																							
F/R/P Pile Caps East	28-Feb-05	18-Mar-05	F/R/P Pile Caps East																							
F/R/P Grade Beams East	14-Mar-05	15-Apr-05	F/R/P Grade Beams East																							
F/R/P Pile Caps West	11-Mar-05	08-Apr-05	F/R/P Pile Caps West																							
F/R/P Basement Wall	21-Mar-05	15-Apr-05	F/R/P Basement Wall																							
F/R/P Grade Beams West	28-Mar-05	29-Apr-05	F/R/P Grade Beams West																							
Erect Steel Seq. 1	28-Mar-05	15-Apr-05	Erect Steel Seq. 1																							
Erect Steel Seq. 2	18-Apr-05	20-May-05	Erect Steel Seq. 2																							
Erect Steel Seq. 3	23-May-05	24-Jun-05	Erect Steel Seq. 3																							
Erect Steel Seq. 4	27-Jun-05	22-Jul-05	Erect Steel Seq. 4																							
Erect Steel Seq. 5	25-Jul-05	19-Aug-05	Erect Steel Seq. 5																							
Steel Deck Seq. 1	11-Apr-05	29-Apr-05	Steel Deck Seq. 1																							
Steel Deck Seq. 2	09-May-05	27-May-05	Steel Deck Seq. 2																							
Steel Deck Seq. 3	13-Jun-05	01-Jul-05	Steel Deck Seq. 3																							
Steel Deck Seq. 4	18-Jul-05	05-Aug-05	Steel Deck Seq. 4																							
Steel Deck Seq. 5	15-Aug-05	02-Sep-05	Steel Deck Seq. 5																							
SOD Rough-in 4th floor	08-Aug-05	19-Aug-05	SOD Rough-in 4th floor																							
SOD Rough-in 3rd floor	22-Aug-05	02-Sep-05	SOD Rough-in 3rd floor																							
SOD Rough-in 2nd floor	06-Sep-05	16-Sep-05	SOD Rough-in 2nd floor																							
Structural Slab Rough-in	08-Aug-05	12-Aug-05	Structural Slab Rough-in																							
Slab-on-grade Rough-in	31-May-05	29-Jul-05	Slab-on-grade Rough-in																							
F/R/P 4th floor	22-Aug-05	25-Aug-05	F/R/P 4th floor																							
F/R/P 3rd floor	06-Sep-05	08-Sep-05	F/R/P 3rd floor																							
F/R/P 2nd floor	19-Sep-05	21-Sep-05	F/R/P 2nd floor																							
F/R/P Structural Slab	05-Jul-05	05-Aug-05	F/R/P Structural Slab																							
F/R/P Slab-on-grade	27-Jun-05	05-Aug-05	F/R/P Slab-on-grade																							
Framing/Sheathing court...	26-Sep-05	21-Oct-05	Framing/Sheathing courtyard area/north side																							
Framing/Seathing west s...	17-Oct-05	28-Oct-05	Framing/Seathing west side																							
Framing/Sheathing south...	24-Oct-05	18-Nov-05	Framing/Sheathing south side																							

█ Actual Work █ Critical Remaining Work ▶ Summary
█ Remaining Work ◆ Milestone

Site Layout Planning

The Food Science Building proves to be a challenging project when looking at the confined site conditions during construction. The Food Science Building is the last of four buildings that Gilbane Building Co. is building on the East Sub Campus Site of The Pennsylvania State University. First there was the Smeal Building along with the Parking Deck, next and still in progress is the Forestry Building and lastly the Food Science Building. Due to this sequence and the logistics of these projects with site hardscape, etc. all of the work ends up finishing and gets pushed towards the Food Science Building. Therefore, the already congested Food Science Site becomes even more congested daily by sharing their space with the Forestry Building.

I've developed a series of eight site plans trying to show these issues along with a detailed look at the structural steel erection sequence of the Food Science Building. Below I will talk about each site plan individually pointing out the key features of each.

SK-1: East Sub Campus Site Plan

This sketch shows the locations of all of the projects and their current state in relation to the Food Science Building. It illustrates the overall East Sub Campus Site in relation to roads and other buildings, along with the site fence and lay down locations.

SK-2: Food Science Building Utilities Plan

This sketch shows the locations of all utilities on or near the Food Science Building. Additionally, it shows new utility work to be installed along with the existing utilities and the utilities that need to be removed.

SK-3: Food Science Building Site Logistics Plan

This sketch shows the location of the Gilbane Site Office along with the OCIP nurses trailer. Additionally, you can see the overall flow through the job with the site fence and gates and the laydown and trailer area around the site. Also, all temporary facilities are shown.

SK-4: Structural Steel Sequence 1

This sketch shows the first phase of the structural steel erection on the Food Science Building. The structural steel sequence was split into five sequences beginning on the east side of the building and working around to the west. The crane used for erection was a Manitowoc lattice-boom crawler crane model I2000. It had a 120 ton lifting capacity with a 230' heavy boom lift. The approximate working radius for the crane when erecting typical steel sizes, as on the Food Science Building, was 175'.

The bays of sequence 1 contained floors 2 and 3. In this location the third floor level is as high as the building goes and it becomes a low roof.

This sketch also shows the flow of the steel delivery trucks, shake out areas, and crane placement. During the first sequence of erection piles were finishing up along with the concrete pile caps, grade beams, and piers. Shoring was needed for the excavation and work of the basement on the west side of the building along curtain road, the placement is shown on the plan. A soilder beam and lagging system was used as the shoring system in this area. It will be left in and backfilled against when the work is complete.

SK-5: Structural Steel Sequence 2

This sketch shows the erection of sequence 2. Sequence 2 worked from the existing corner of the previously erected steel out as designated by the arrows in the sketch. Sequence 2 erection went from the second floor level to the high roof of the building five stories up. Additionally, during this sequence a small ramp was built against the buildings grade beam inside the courtyard. This was to provide access into this area of the building for the multiple trades that were beginning work. The ramp merely acted as a ramp to be able to drive over top the grade beam.

SK-6: Structural Steel Sequence 3

This sketch shows the erection of sequence 3. Sequence 3 is the linking section between the east and west of the building. The steel in this area went from the 2nd floor to the penthouse level 6 stories up.

SK-7: Structural Steel Sequence 4

This sketch shows the erection of sequence 4. At this sequence it was necessary for the crane to move out of the courtyard area due to congestion. This was a critical area that was needed for many other trades to begin their work. Therefore the crane moved to the far west side of the building for the remaining erection of the building. At this point it was also becoming too congested for the steel trucks to drive around the entire site as they have been. Therefore, for the few remaining deliveries of steel they chose to back the trucks off Curtain Rd. into the site. This section went from the first floor level, above the basement, to the high roof level five stories up.

SK-8: Structural Steel Sequence 5

This sketch shows the erection of the last sequence of steel, sequence five. Sequence five was performed similarly to sequence four. The bays of sequence 5 contained floors 2 and 3. In this location the third floor level is as high as the building goes and it becomes a low roof. Additionally, by this time the building is starting to be detailed and decked out and slabs were being poured. Therefore, the typical location of the concrete pump set-up and path of the concrete trucks is also shown on the plan.

**The Pennsylvania State University
Food Science Building
HOME OF THE NEW CREAMERY &
THE DEPARTMENT OF FOOD SCIENCES**

NOTES:

THIS SITE PLAN REPRESENTS THE CURRENT VIEW OF THE FOOD SCIENCE PROJECT IN RELATION TO THE OTHER EAST SUBCAMPUS BUILDINGS THAT GILBANE BUILDING CO. IS WORKING ON.

THIS SITE PLAN REPRESENTS THE MAJOR CHANGES THAT HAPPENED TO SITE LOGISTICS DURING THE CONSTRUCTION OF FOOD SCIENCE BUILDING. THESE CHANGES AFFECTED MOSTLY SITE OFFICE RELOCATION, SITE FENCE & PEDESTRIAN ACCESS, AND ON-SITE LAY DOWN & TRAILER AREA.

SCALE:

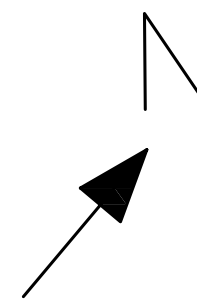
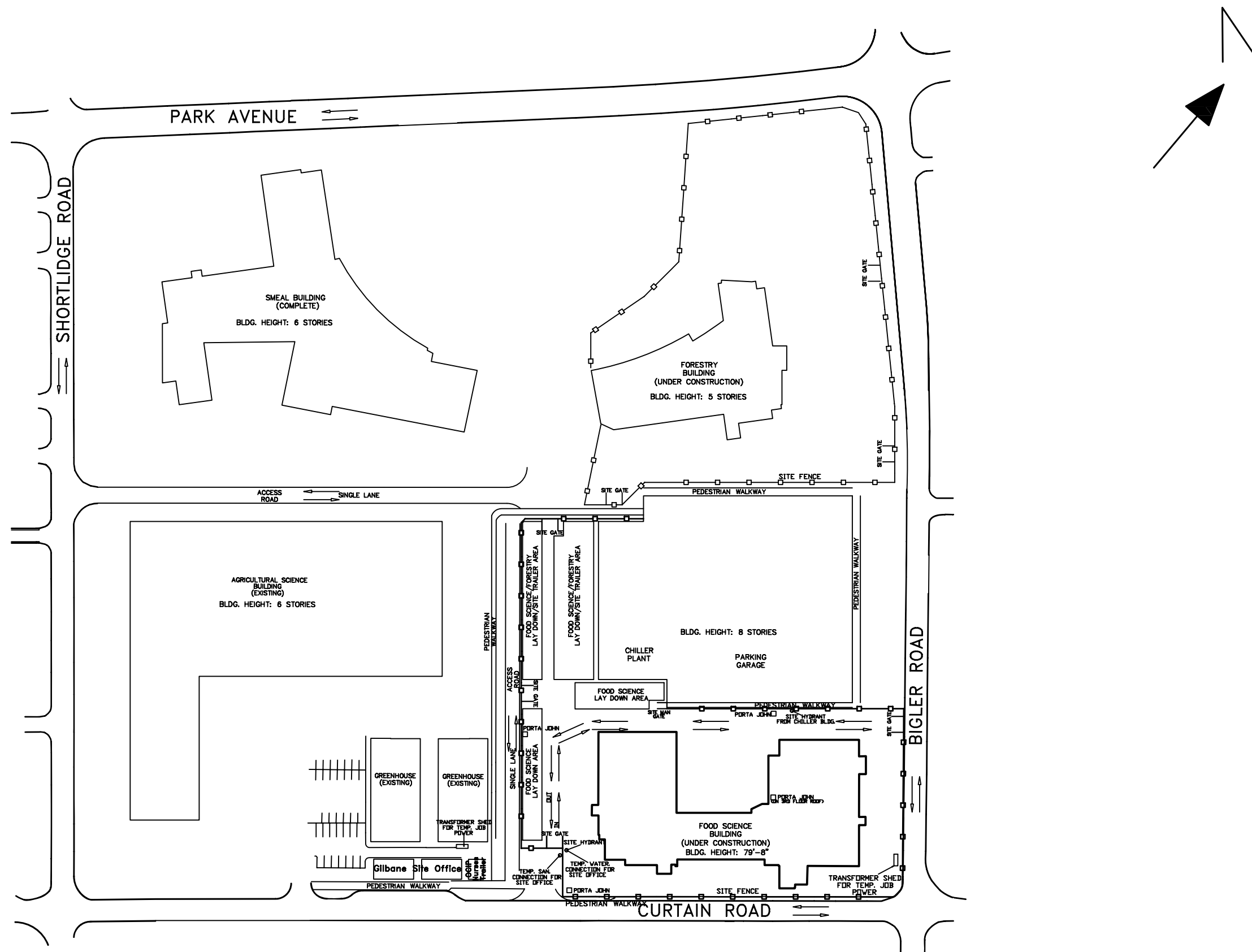
PLAN IS DRAWN TO SCALE.

DRAWN BY:

ANTHONY J. LUCOSTIC
CONSTRUCTION MANAGEMENT
5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
- BLDG. FOOTPRINT
- WALKWAYS/ACCESS
- SITE OFFICE
- LAY DOWN/TRAILER
- TEMP. FACILITIES



EAST SUB CAMPUS SITE PLAN

IKM INCORPORATED
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INTERIOR DESIGNERS
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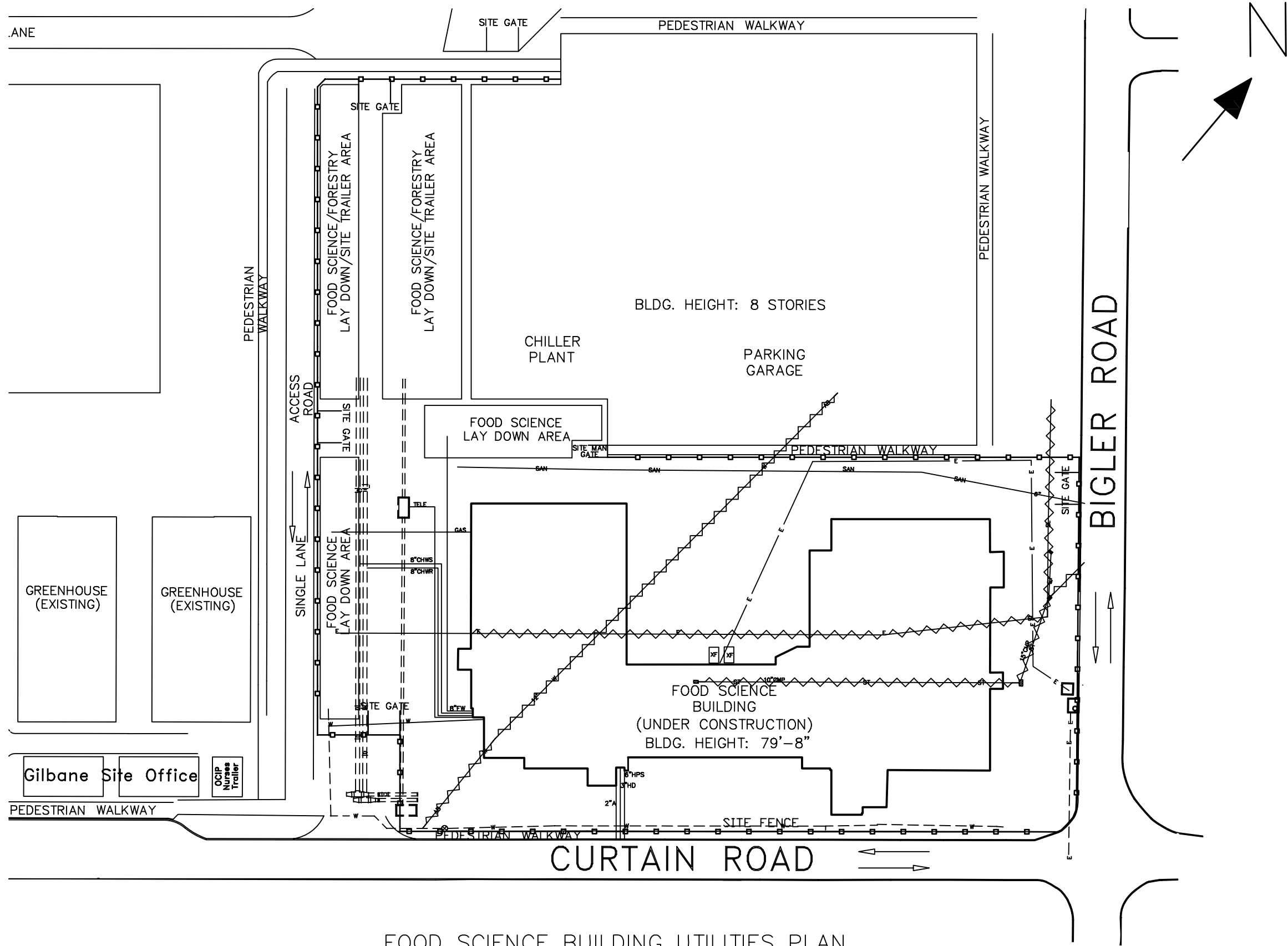
**The Pennsylvania State University
Food Science Building**
EAST SUB CAMPUS SITE PLAN

JOB NO.
IKM 02-091
DGS800-271
PSU-01778

DATE
10/31/05

DWG. NO.

SK-1



**The Pennsylvania State University
Food Science Building
HOME OF THE NEW CREAMERY &
THE DEPARTMENT OF FOOD SCIENCES**

NOTES:
THIS SITE PLAN CONTAINS THE UTILITIES (NEW & DEMO) ALONG WITH THE JOB LAY-DOWN AND TRAILER AREAS WHICH ARE SHARED WITH THE FORESTRY BUILDING AS SEEN ON SK-1.

SCALE:
PLAN IS DRAWN TO SCALE.

DRAWN BY:
ANTHONY J. LUCOSTIC
CONSTRUCTION MANAGEMENT
5TH YEAR SENIOR THESIS PROJECT

- LEGEND:**
- SITE FENCE
 - BLDG. FOOTPRINT
 - WALKWAYS/ACCESS
 - SITE OFFICE
 - LAY DOWN/TRAILER
 - ~ DEMO UTILITIES
 - NEW UTILITIES
 - - - EX. UTILITIES

FOOD SCIENCE BUILDING UTILITIES PLAN

IKM INCORPORATED
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FOOD SCIENCE UTILITIES PLAN

JOB NO.
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DGS800-271
PSU-01778
DATE
10/31/05

DWG. NO.
SK-2

The Pennsylvania State University
Food Science Building
 HOME OF THE NEW CREAMERY &
 THE DEPARTMENT OF FOOD SCIENCES

NOTES:

THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS OF THE PROJECT, INCLUDING BLDG. FOOTPRINT, SITE FENCE, SITE OFFICE, TEMP. FACILITIES, AND LAY DOWN & TRAILER AREAS.

SCALE:

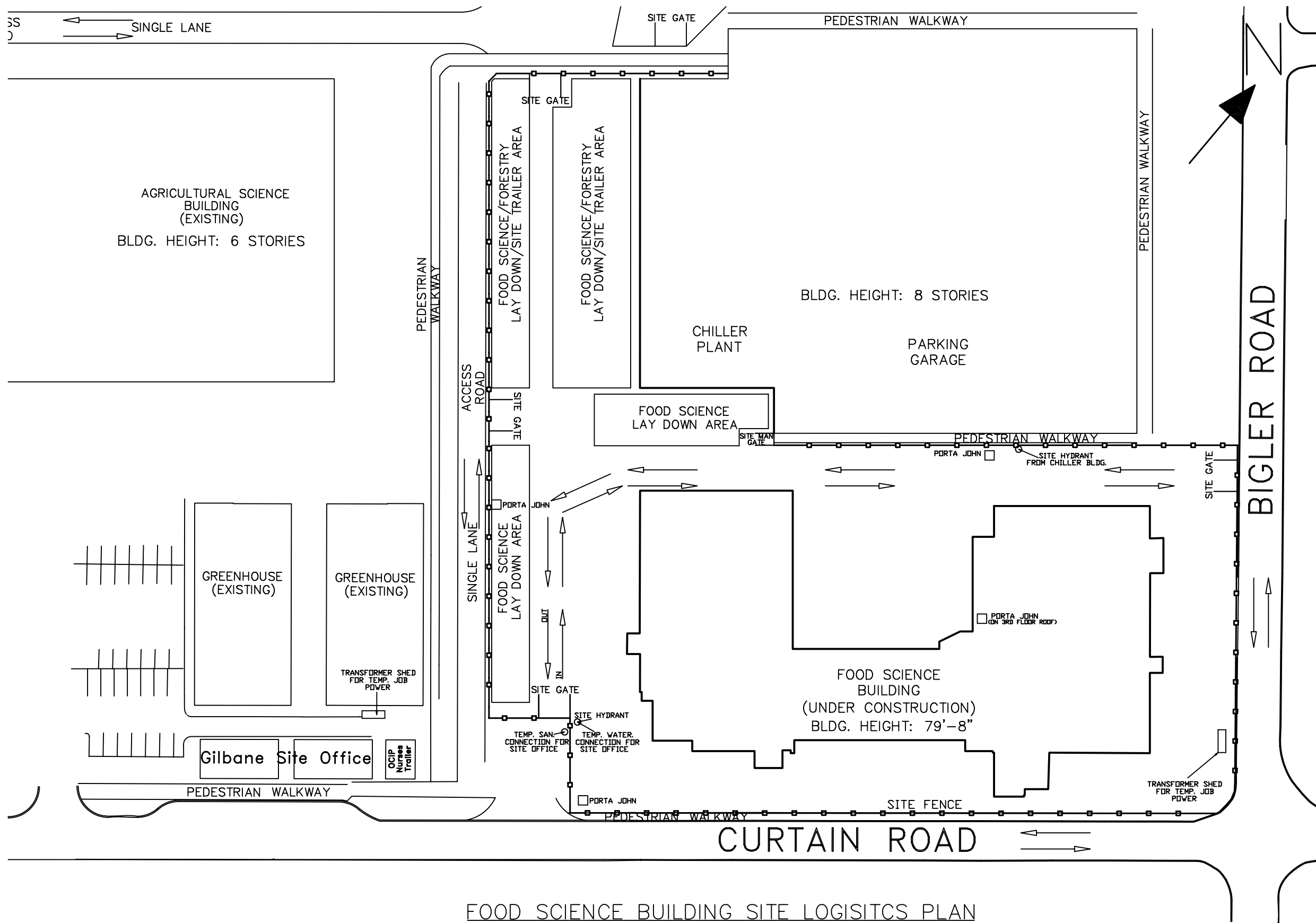
PLAN IS DRAWN TO SCALE

DRAWN BY:

ANTHONY J. LUCOSTIC
 CONSTRUCTION MANAGEMENT
 5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
- BLDG. FOOTPRINT
- WALKWAYS/ACCESS
- SITE OFFICE
- LAY DOWN/TRAILER
- TEMP. FACILITIES



FOOD SCIENCE BUILDING SITE LOGISITCS PLAN

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The Pennsylvania State University
Food Science Building

FOOD SCIENCE SITE PLAN

JOB NO.
 IKM 02-091
 DGS800-271
 PSU-01778

DATE
 10/31/05

DWG. NO.

SK-3

The Pennsylvania State University
Food Science Building
 HOME OF THE NEW CREAMERY &
 THE DEPARTMENT OF FOOD SCIENCES

NOTES:

THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS DURING THE ERECTION OF THE STRUCTURAL STEEL ON THE FOOD SCIENCE BUILDING.

CRANE:
 MANITOWOC 12000
 120 TON LIFT CAPACITY
 230' HEAVY BOOM LIFT
 APPROX. 175' WORKING RADIUS

SCALE:

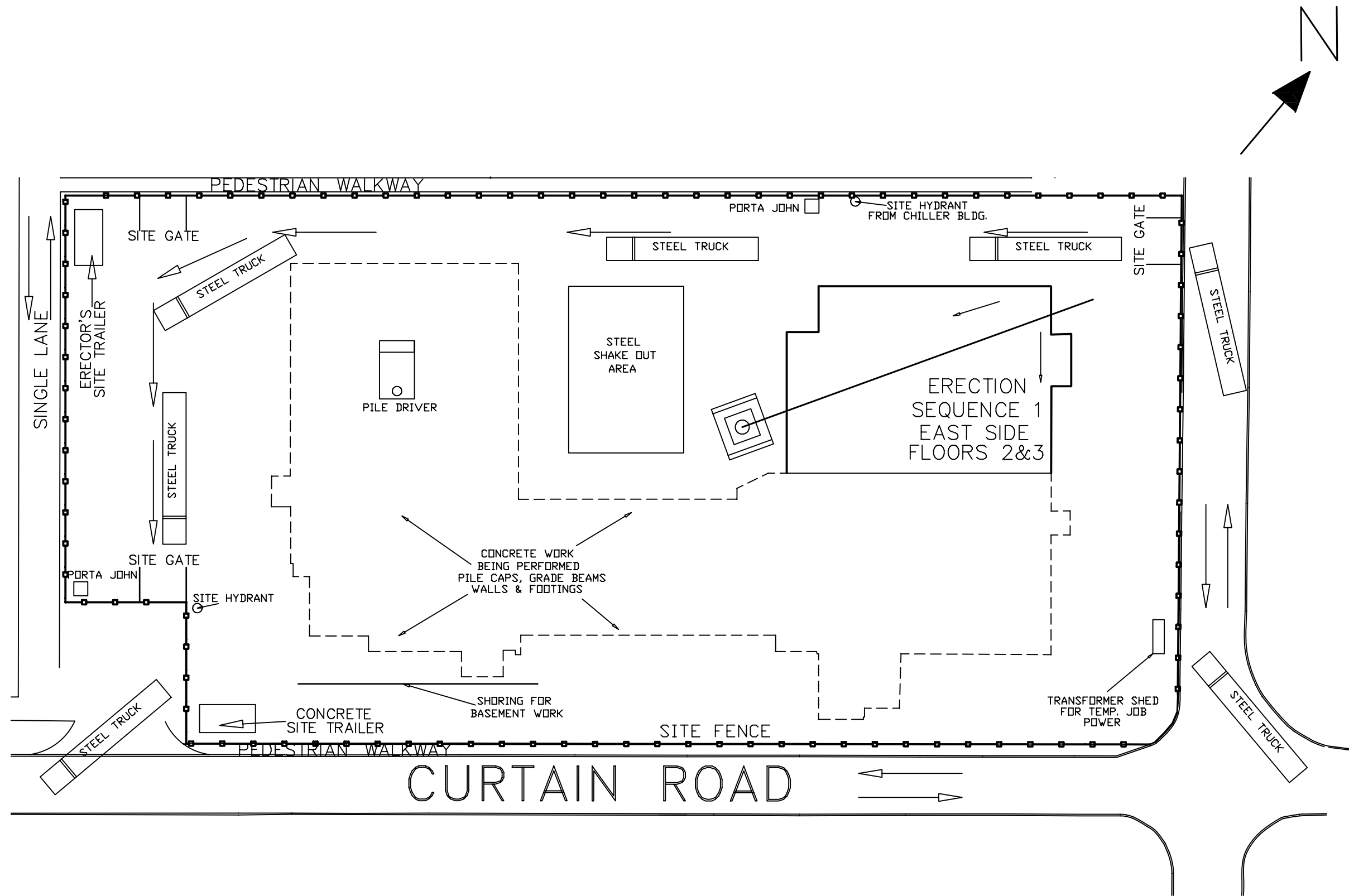
PLAN IS DRAWN TO SCALE.

DRAWN BY:

ANTHONY J. LUCOSTIC
 CONSTRUCTION MANAGEMENT
 5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
- BLDG. FOOTPRINT
- WALKWAYS/ACCESS
- SITE OFFICE
- LAY DOWN/TRAILER
- TEMP. FACILITIES



FOOD SCIENCE BUILDING
 STRUCTURAL STEEL SEQUENCE 1

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The Pennsylvania State University
Food Science Building
 STRUCTURAL STEEL SEQUENCE

JOB NO.
 IKM 02-091
 DGS800-271
 PSU-01778
 DATE
 10/31/05

DWG. NO.
SK-4

The Pennsylvania State University
Food Science Building
 HOME OF THE NEW CREAMERY &
 THE DEPARTMENT OF FOOD SCIENCES

NOTES:

THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS DURING THE ERECTION OF THE STRUCTURAL STEEL ON THE FOOD SCIENCE BUILDING.

CRANE:
 MANITOWOC 12000
 120 TON LIFT CAPACITY
 230' HEAVY BOOM LIFT
 APPROX. 175' WORKING RADIUS

SCALE:

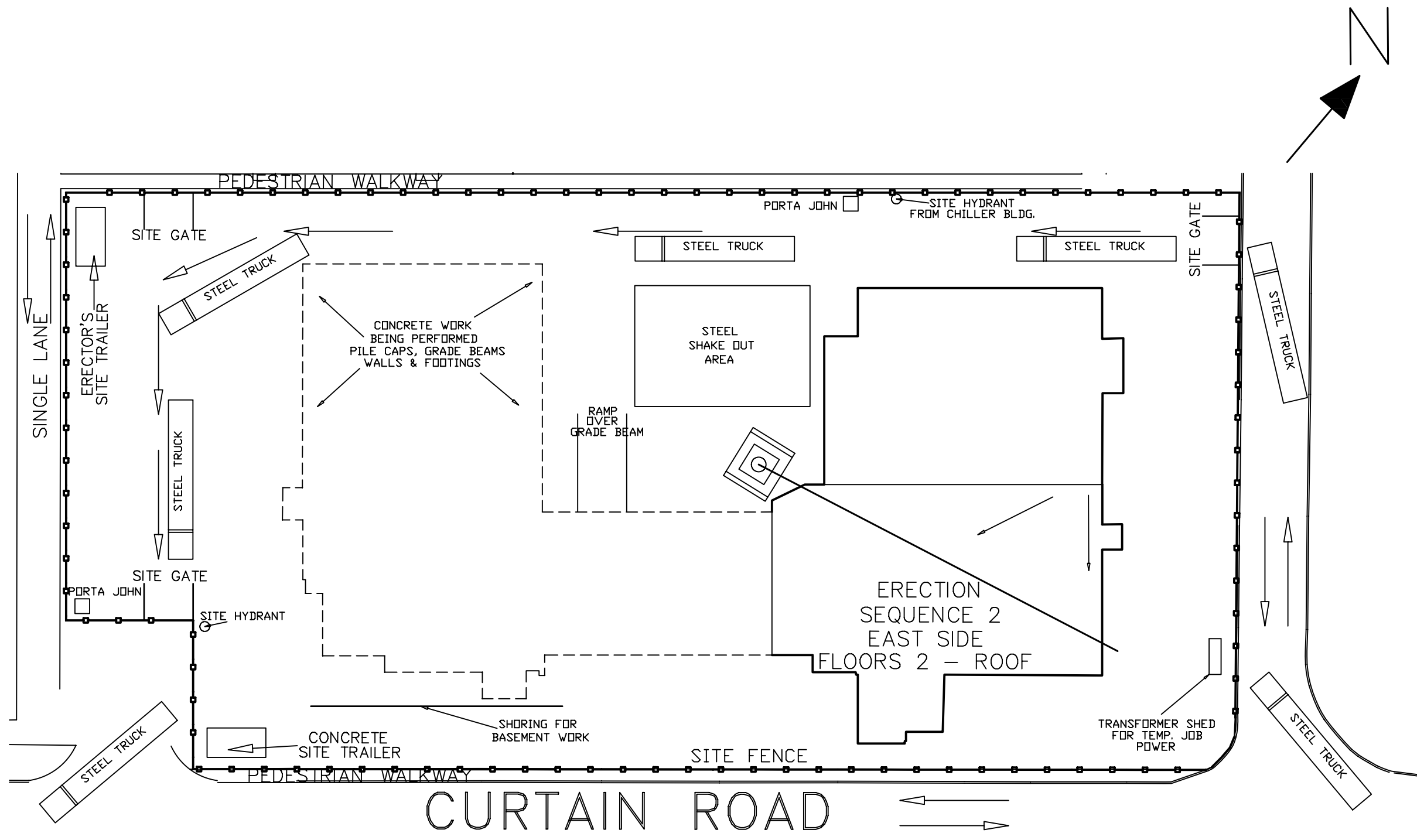
PLAN IS DRAWN TO SCALE.

DRAWN BY:

ANTHONY J. LUCOSTIC
 CONSTRUCTION MANAGEMENT
 5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
- BLDG. FOOTPRINT
- WALKWAYS/ACCESS
- SITE OFFICE
- LAY DOWN/TRAILER
- TEMP. FACILITIES



FOOD SCIENCE BUILDING
 STRUCTURAL STEEL SEQUENCE 2

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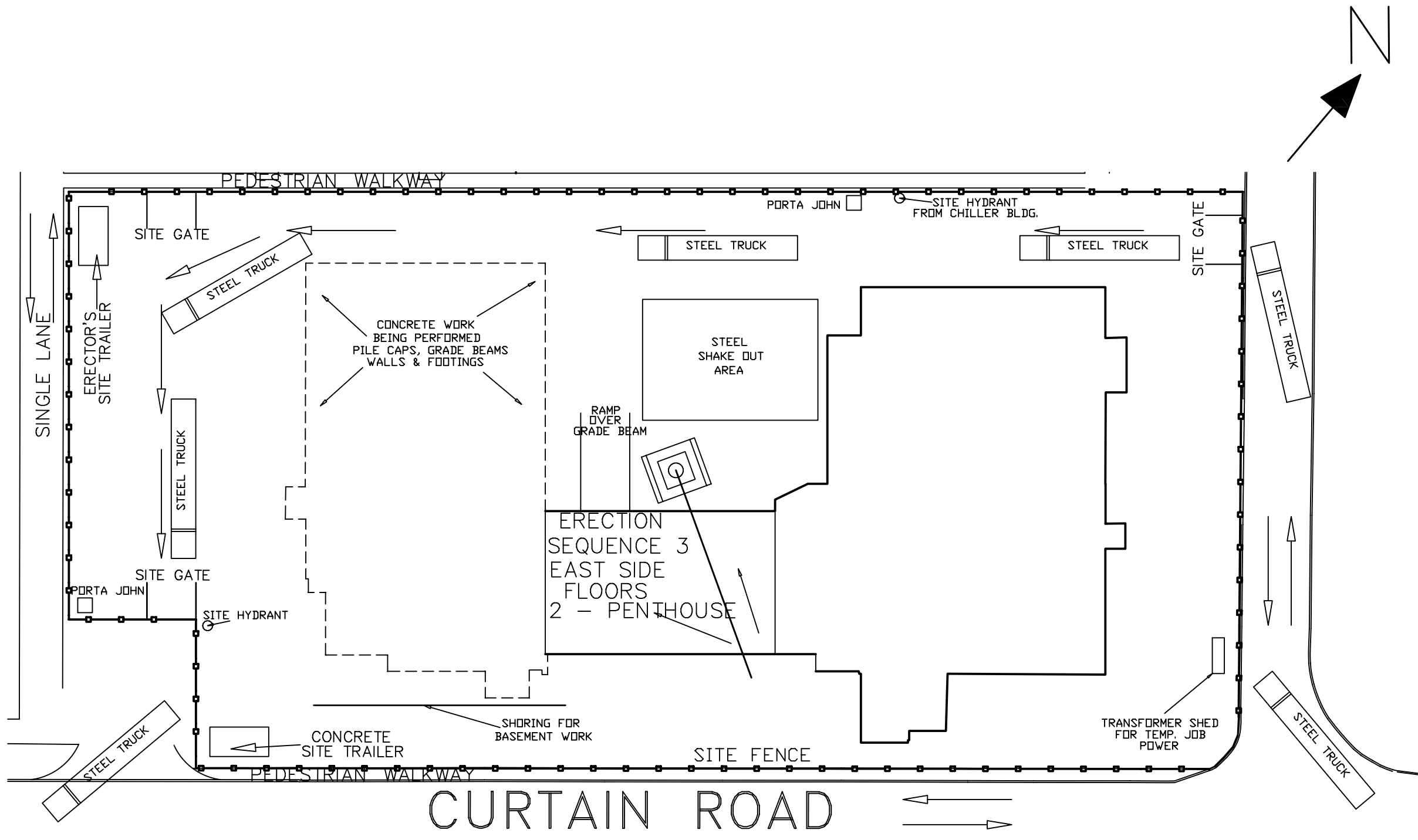
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The Pennsylvania State University
Food Science Building
 STRUCTURAL STEEL SEQUENCE

JOB NO.
 IKM 02-091
 DGS800-271
 PSU-01778
 DATE
 10/31/05

DWG. NO.
SK-5



NOTES:
 THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS DURING THE ERECTION OF THE STRUCTURAL STEEL ON THE FOOD SCIENCE BUILDING.
 CRANE:
 MANITOWOC 12000
 120 TON LIFT CAPACITY
 230' HEAVY BOOM LIFT
 APPROX. 175' WORKING RADIUS

SCALE:
 PLAN IS DRAWN TO SCALE.

DRAWN BY:
 ANTHONY J. LUCOSTIC
 CONSTRUCTION MANAGEMENT
 5TH YEAR SENIOR THESIS PROJECT

LEGEND:
 □ SITE FENCE
 _____ BLDG. FOOTPRINT
 _____ WALKWAYS/ACCESS
 _____ SITE OFFICE
 _____ LAY DOWN/TRAILER
 _____ TEMP. FACILITIES

FOOD SCIENCE BUILDING
 STRUCTURAL STEEL SEQUENCE 3

The Pennsylvania State University
Food Science Building
 HOME OF THE NEW CREAMERY &
 THE DEPARTMENT OF FOOD SCIENCES

NOTES:

THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS DURING THE ERECTION OF THE STRUCTURAL STEEL ON THE FOOD SCIENCE BUILDING.

CRANE:
 MANITOWOC 12000
 120 TON LIFT CAPACITY
 230' HEAVY BOOM LIFT
 APPROX. 175' WORKING RADIUS

SCALE:

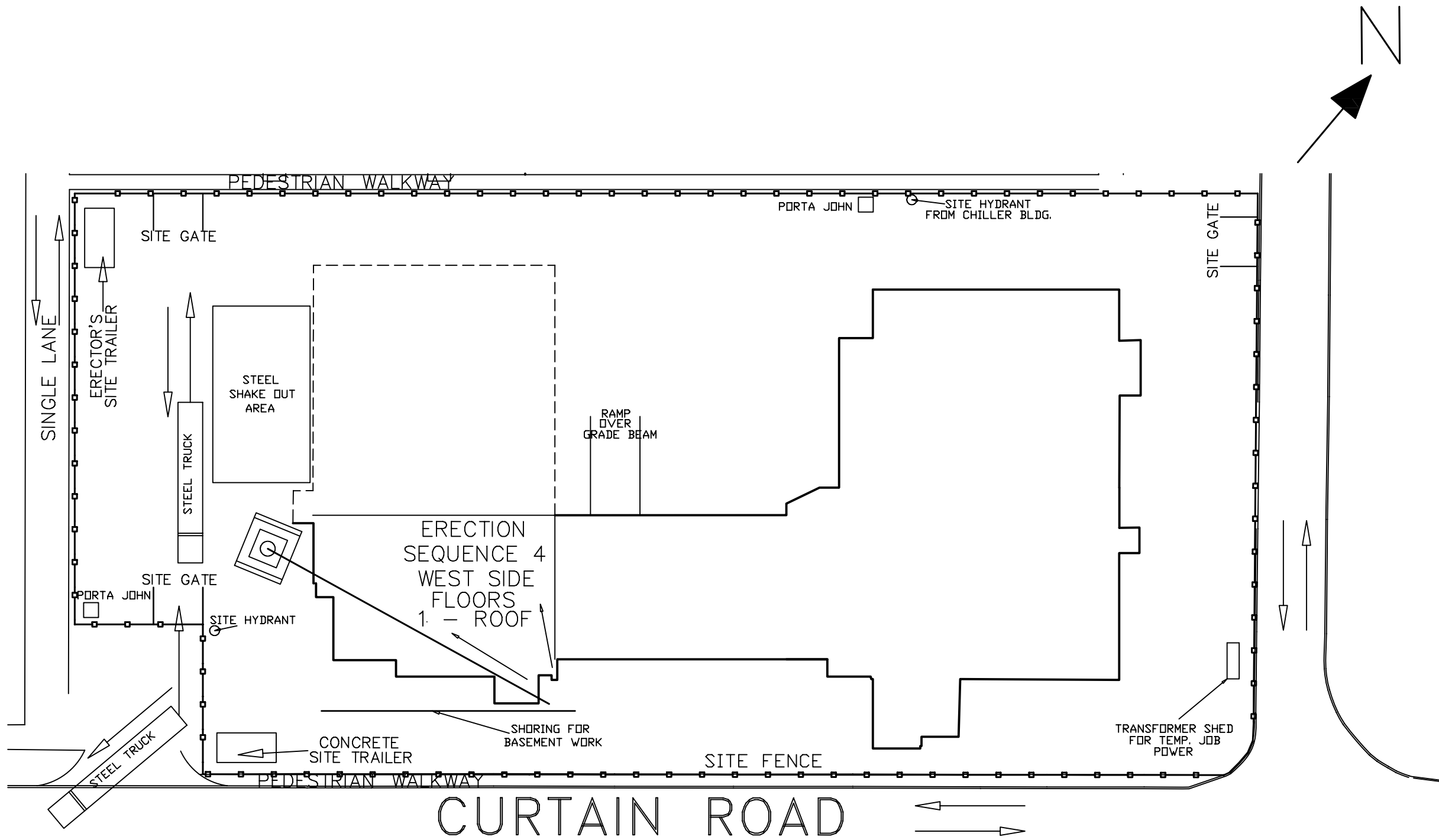
PLAN IS DRAWN TO SCALE.

DRAWN BY:

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 CONSTRUCTION MANAGEMENT
 5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
- BLDG. FOOTPRINT
- WALKWAYS/ACCESS
- SITE OFFICE
- LAY DOWN/TRAILER
- TEMP. FACILITIES



CURTAIN ROAD

FOOD SCIENCE BUILDING
 STRUCTURAL STEEL SEQUENCE 4

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The Pennsylvania State University Food Science Building	JOB NO. IKM 02-091 DGS800-271 PSU-01778	DWG. NO.
	DATE 10/31/05	SK-7

The Pennsylvania State University
Food Science Building
 HOME OF THE NEW CREAMERY &
 THE DEPARTMENT OF FOOD SCIENCES

NOTES:

THIS SITE PLAN IS A REPRESENTATION OF THE SITE LOGISTICS DURING THE ERECTION OF THE STRUCTURAL STEEL ON THE FOOD SCIENCE BUILDING.

CRANE:
 MANITOWOC 12000
 120 TON LIFT CAPACITY
 230' HEAVY BOOM LIFT
 APPROX. 175' WORKING RADIUS

SCALE:

PLAN IS DRAWN TO SCALE.

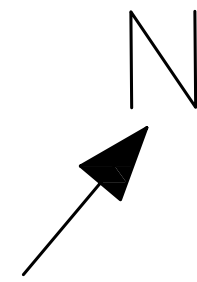
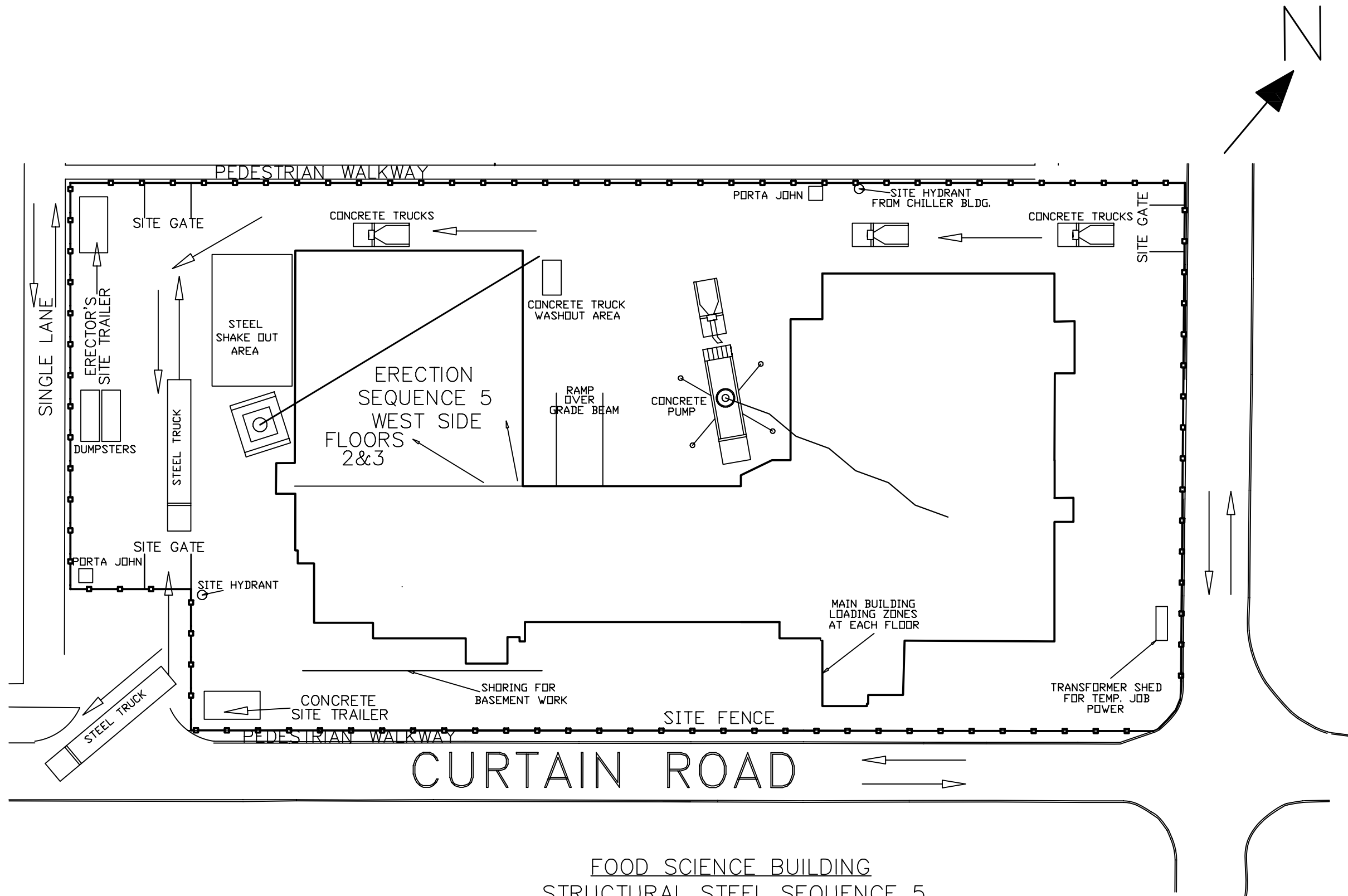
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 5TH YEAR SENIOR THESIS PROJECT

LEGEND:

- SITE FENCE
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FOOD SCIENCE BUILDING
 STRUCTURAL STEEL SEQUENCE 5



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The Pennsylvania State University
Food Science Building
 STRUCTURAL STEEL SEQUENCE

JOB NO.
 IKM 02-091
 DGS800-271
 PSU-01778
 DATE
 10/31/05

DWG. NO.
SK-8

Assemblies Estimate of the Fire Protection System
for Food Science Building

The following is an assemblies estimate of the Food Science Building's Fire Protection System. The take-off quantities were taken from the contract documents while the per unit costs were taken from Cost Works 2005. All numbers include installation, material handling and delivery, and all equipment necessary to complete the work. Below is a summary of the results found:

Summary:

Assemblies Estimate for Fire Protection System
CSI Specification Section 14000

Total Cost for Fire Protection System	313,859
Total Cost for Entire System Per Square Foot	2.57
Total Cost for Dry System Per Square Foot	3.28
Total Cost for Wet System Per Square Foot	2.68

The estimate calculated with cost works turned out to be \$18,107 dollars shy of the realistic \$331,966 estimate which was used on the job. One reason for this error would be the misc. metals that were added for the support of the system. This add occurred in the early phases of bidding through an addendum to the Fire Protection Contract.

On the following page you will find the take-off checklist used to find these numbers categorized by CSI Uniformat II.

Assemblies Estimate of the Fire Protection System
for Food Science Building

Take Off:

Assemblies Estimate for Fire Protection System

Spec. Section	Area	Unit	Cost per Unit	Total Cost
14310	<u>Dry Pipe Sprinkler System:</u>	<u>Ordinary Hazard, one floor</u>		
	Cooler/Freezer/Loading Dock	5,000 sf	- 3.28	-
	Total			16,400
14320	<u>Wet Pipe Sprinkler System:</u>	<u>Stand Pipes</u>		
	First Floor	1 flr	8,550.00	8,550
	Second Floor	1 flr	2,300.00	2,300
	Third Floor	1 flr	2,300.00	2,300
	Fourth Floor	1 flr	2,300.00	2,300
	Penthouse	1 flr	2,300.00	2,300
	Total			17,750
14410	<u>Wet Pipe Sprinkler System:</u>	<u>Ordinary Hazard, one floor</u>		
	Basement	3,000 sf	- 2.42	-
	First Floor	23,750 sf	2.76	65,550
	Second Floor	28,750 sf	2.27	65,263
	Third Floor	28,750 sf	2.27	65,263
	Fourth Floor	28,750 sf	2.27	65,263
	Penthouse	4,000 sf	2.37	9,480
	Total			278,078
14420	<u>Wet Pipe Sprinkler System:</u>	<u>Fire House Equipment</u>		
	2-1/2" Hose Station w/Cabinet	2 ea	303.00	606
	Siamese polished brass	1 ea	1,025.00	1,025
	Total			1,631
Total Cost for Fire Protection System				313,859

Assumptions:

*Numbers are all inclusive, containing material handling, installation, and all necessary equipment fees.

*Cost Works' per unit cost numbers are current and apply to the University Park Area.

Details:

Dry Pipe Sprinkler System: Steel, Black, SCH 40 Pipe

Wet Pipe Sprinkler System: Steel, Black, SCH 40 Pipe

Wet Pipe Sprinkler Stand Pipes: Class I, Steel, Black, SCH 40, 6" Dia. Pipe, 10' height

Detailed Structural System Estimate

The estimate below is the detailed structural systems estimate for the entire Food Science Building superstructure. This included bid packages 02 Piles, 03 Concrete, and 05 Structural Steel. The cost per unit numbers that I used to figure out my systems cost were obtained from Gilbane Building Co.'s Estimating Department and are the actual competitive numbers from the market when the project went out to bid. By using these numbers I was able to create an accurate estimate that would coincide with the numbers used in my previous estimate analysis from tech assignment 1. Additionally, it will put an accurate perspective of cost ratios for the job and the area.

The total unit costs presented in this estimate include all appropriate labor (at local rates), material and equipment costs necessary for a complete installation along with fringe benefits, trade subcontractor overhead, profit and bonds. Below you will find a summary of the results found. Additionally, on the following page a detailed cost breakdown is shown.

Cost Breakdown of Entire Building Superstructure

Bid Package	Description	Takeoff Quantity	Total Amount
02	Piles	330 piles	1,199,214.00
03	Concrete	22,365.00 cy	2,034,938.00
05	Structural Steel	1,888.00 ton	2,629,773.00
Total Superstructure Cost			5,863,925.00
Total Superstructure Cost per Square Foot			48.06 / sf
Total Superstructure Cost per cy of Concrete			262.19 / cy
Total Superstructure Cost per ton of Steel			3105.89 / ton

Detailed Cost Breakdown of Entire Building Superstructure

Bid Package	Description	Takeoff Quantity		Total Cost/Unit	Total Amount
02	Piles				
	Steel Piles Round 7" Tip	17,050.00	vf	61.50	1,048,575
	Tension Piles	125.00	vf	50.98	6,373
	Steel Piles Round - Break Factor 7" Tip	1,249.00	vf	41.74	52,133
	Steel Piles Round - Obstruction Factor 7" Tip	1,249.00	vf	41.74	52,133
	Piles - Spoils Removal	1.00	ls	15,000.00	15,000
	Piles - Compression Testing	1.00	ls	25,000.00	25,000
02	Piles				1,199,214
03	Concrete				
	Building Excavation - Gravel Base under Slab	950.00	cy	25.00	23,750
	Slab on Grade - 4"	73.00	cy	265.00	19,345
	Slab on Grade - 5"	217.00	cy	265.00	57,505
	Slab on Grade - 6"	111.00	cy	265.00	29,415
	Slab Haunch	21.60	cy	265.00	5,724
	Slab on Deck	1,889.00	cy	325.00	613,925
	Concrete Pan Stair Fill	2,278.00	sf	29.45	67,087
	Grade Beam	542.25	cy	425.00	230,456
	Pile Cap	211.00	cy	550.00	116,050
	Foundation Wall	502.00	cy	600.00	301,200
	8" Structural Slab	532.36	cy	575.00	306,107
	Encase Steel Beams	135.00	cy	750.00	101,250
	Precast Double Tees Install	8,590.00	cy	9.54	81,949
	Precast Double Tees Supply	8,590.00	cy	9.45	81,176
03	Concrete	22,364.21	cy		2,034,938
05	Structural Steel				
	Structural Steel Misc. Framing	55.00	ton	2,000.00	110,000
	Structural Steel Plates	106.00	ea.	350.00	37,100
	Bearing Plates	9.00	ea.	370.75	3,337
	Structural Steel - Columns	6.00	ton	1,779.15	10,675
	Structural Steel	770.15	ton	1,779.15	1,370,212
	Structural Steel HSS 4x2x1/8	1.20	ton	1,779.20	2,135
	Structural Steel HSS 6x6x1/4	4.50	ton	1,779.20	8,006
	Structural Steel - Market Conditions	1,010.00	ton	700.00	707,000
	Moment Connections	237.00	ea.	370.75	87,868
	Shear Studs	5,390.00	ea.	2.35	12,667
	Pour Stop	40.79	ton	2,038.54	83,152
	Metal Roof Deck 3"x20 Ga.	12,300.00	sf	1.62	19,926
	Metal Roof Deck 3"x18 Ga.	98,174.00	sf	1.81	177,695
05	Structural Steel	1,887.64	ton		2,629,773
	Total Superstructure Estimate				5,863,925

* Unit costs provided by Gilbane Building Co. Estimating Department at current market conditions during bid time.

* All numbers include total overall cost for material, installation, shipping, storage, etc.

General Conditions Estimate
for Food Science Project

The General Conditions Estimate provided below is my representation of the general conditions owned by the construction manager on the Food Science Project. The total costs per unit are an all inclusive costs for set-up and tear-down and any additional costs that are necessary for that particular task. The Costs/Unit came from Cost Works 2005 and are assumed to be the current market conditions costs for the center Pennsylvania area. The estimate includes all project staffing, fees, office supplies, and temporary services which can be broken down into monthly job costs. Below find the take-off breakdown of the general conditions estimate:

General Conditions Estimate

Spec Section	Task	Description	Quantity	Total Cost/Unit	Total Amount
1170	Surveying	Crew for layout of building, trenching and piping	30 day	900.00	27,000
1310	Bond	Performance	2.50% ea.	37,500,000.00	937,500
1310	Clerk		80 wk	500.00	40,000
1310	Field Engineer		80 wk	1,550.00	124,000
1310	Project Executive		100 wk	2,875.00	287,500
1310	Project Manager		90 wk	2,525.00	227,250
1310	Ass. Project Manager General		80 wk	2,225.00	178,000
1310	Superintendent		85 wk	2,675.00	227,375
1310	Ass. Superintendent		80 wk	2,150.00	172,000
1310	MEP Superintendent		85 wk	2,325.00	197,625
1310	Ass. MEP Super.		80 wk	2,150.00	172,000
1310	Laborer		150 wk	1,625.00	243,750
1320	Scheduler	Update the Job Schedule	8 ea.	450.00	3,600
1321	Photographer	Areial Job Photos	3 ea.	760.00	2,280
	Temp. Site Office				
1510	Power	400amp Underground Feed	1 ea.	1,950.00	1,950
1520	Site Office Trailers	32x8	33 mo.	180.00	5,940
1520	Field Office Expense	Office Equipment Rental Average	20 mo.	175.00	3,500
1520	Office Supplies	Average	20 mo.	93.50	1,870
1520	Telephone Bill	Average bill includes long distance	20 mo.	224.00	4,480
1520	Field Office Utilities	Lights and HVAC	60 mo.	108.00	6,480
1540	Walk Through Frame	Scaffold Buck to make walkway for sidewalk along Curtain Rd.	50 ea.	2.20	110
1540	Scaffold Plank	2"x10"x16'	100 ea.	5.50	550
1560	Site Fence	8' high	1100 lf	24.00	26,400
1590	Site Office Toilet	Running Water Restroom Facilities	3 ea.	71.50	215
Total					2,891,375
General Conditions Costs per Month					83,756
*Based upon an 11 month schedule (January 2005 - August 2006)					

*Assumptions: on following page.

General Conditions Estimate for Food Science Project

Assumptions:

- *AE fees are by owner.
- *No labor shortage problems in area.
- *Job site transformer / temporary power / lighting is in electrical subcontractors package.
- *All cranes and lifts needed are to be supplied by trade subcontractor as necessary.
- *No winter protection included.
- *Road sweeping by general trades subcontractor.
- *Assume site fence includes all necessary gates.
- *OCIP, therefore no insurance program required.
- *Project schedule January 2005 to August 2006. 20 months

The general condition estimate total is approximately \$1.1 million below the average 10% of the contract value. The main source for this error would be in the way the contracts are written and the bid packages awarded. A lot of the tasks that are normally in the GC's general conditions were made the responsibility of the subcontractors. For example, the crane was owned by the structural steel erection contractor. The temporary transformer, building power, and lighting was owned by the electrical subcontractor. The road sweeping for the job was owned by the general trades subcontractor, etc. Additionally, the salary costs per week for the project staffing are assumed to be a bit lower than actual; this could make a significant difference because your on-site staffing is normally the largest general conditions item you will have on a project. When the above is taken into account it is my belief that the above general conditions estimate would be directly comparable to the actual.