

## **FACTSHEET**

**TITLE: SPECIAL PERMIT NO. 1979**, requested by Olsson Associates on behalf of Chicago, Burlington and Quincy Railroad Company, for authority to construct a 143' tall broadcast tower to accommodate antennae for its private microwave communications system, with a request to waive the landscaping requirements, on property generally located southwest of the intersection of Northwest Roundhouse Drive and West "O" Street.

**SPONSOR:** Planning Department

**BOARD/COMMITTEE:** Planning Commission  
Public Hearing: 07/24/02  
Administrative Action: 7/24/02

**RECOMMENDATION:** Conditional approval (9-0: Carlson, Larson, Newman, Schwinn, Steward, Bills-Strand, Duvall, Krieser and Taylor voting 'yes').

**STAFF RECOMMENDATION:** Conditional approval.

### **FINDINGS OF FACT:**

1. The staff recommendation of conditional approval, including approval of the waiver of landscaping, is based upon the "Analysis" as set forth on p.3-5, concluding that this request is located in the industrial corridor running parallel to and south of West O Street, a corridor in which the predominant land use is railroad facilities. The proposed tower is consistent with the existing development and land use pattern in this area, and given the existing development the waiver to the landscaping design standard is appropriate. If the waiver is approved, this request meets the requirements of the Zoning Ordinance and is consistent with the Comprehensive Plan.
2. The report and recommendations of the Nebraska Capitol Environs Commission is found on p.25-26.
3. On July 24, 2002, this application was removed from the Consent Agenda and had separate public hearing due to a letter in opposition received from Ron Sisel.
4. The applicant's testimony is found on p.6 and 7. The applicant confirmed that this tower will not be painted and will not be lighted. There will also be no ground lighting attached to the tower.
5. Testimony in opposition is found on p.6-7, and the record consists of one letter in opposition (p.27-37). The issue of the opposition is light pollution and overspill from the railroad yard lights.
6. The applicant informed the Commission that the complaint and request by the opposition is currently being reviewed and considered by the Railroad's engineering group at a higher level.
7. On July 24, 2002, the Planning Commission agreed with the staff recommendation and voted 9-0 to recommend conditional approval, finding that the issue raised by the opposition is not specific to this application.

**FACTSHEET PREPARED BY:** Jean L. Walker

**DATE:** August 5, 2002

**REVIEWED BY:** \_\_\_\_\_

**DATE:** August 5, 2002

**REFERENCE NUMBER:** FS\CC\2002\SP.1979

**CITY OF LINCOLN/LANCASTER COUNTY PLANNING STAFF REPORT**

**P.A.S.** Special Permit #1979

**DATE:** July 10, 2002

**PROPOSAL** Burlington Railroad is proposing a 143' tall broadcast tower to accommodate antennas for its private microwave communications system.

**WAIVER REQUEST:** The applicant is seeking a waiver to the landscaping design standard.

**CONCLUSION:** This request is located in the industrial corridor running parallel to and south of West O Street, a corridor in which the predominant land use is railroad facilities. The proposed tower is consistent with the existing development and land use pattern in this area, and given the existing development the waiver to the landscaping design standard is appropriate. If the waiver is approved, this request meets the requirements of the Zoning Ordinance and is consistent with the Comprehensive Plan.

<b><u>RECOMMENDATION:</u></b>	Special Permit:	Conditional Approval
	Waiver to Landscaping:	Approve

**GENERAL INFORMATION**

**LEGAL DESCRIPTION:** Lot 109 I.T. located in the NW 1/4 of Section 27, T10N, R7E of the 6<sup>th</sup> P.M., Lancaster County, Nebraska.

**LOCATION:** Southwest of the intersection of Northwest Roundhouse Drive and West O Street.

**APPLICANT/  
OWNER** Chicago, Burlington and Quincy Railroad Company  
4515 Kansas Avenue  
Kansas City, MO 66106

**CONTACT:** Stephen Clymer  
Olsson Associates  
1111 Lincoln Mall  
Lincoln, NE 68508  
(402) 457-5987

**EXISTING ZONING:** I-1 Industrial District

**EXISTING LAND USE:** Railroad Yard

**SURROUNDING LAND USE AND ZONING:**

North	Commercial, Industrial	I-1
South	Industrial, Vacant	I-1
East	Industrial	I-1
West	Industrial	I-1

**COMPREHENSIVE PLAN SPECIFICATIONS:** The 2025 Comprehensive Plan’s Land Use Plan designates industrial land uses in this area. The following general principle is applicable:

1. **Page F40** General Principles for all Commercial and Industrial Uses - Compatible with existing or planned residential uses.

**ANALYSIS**

**OVERVIEW:**

The Railroad is proposing to erect a 143' broadcast tower to support microwave antennas that are used to communicate with other railroad facilities in the area and with passing trains. It is not a wireless facility for cellular or personal communications services. A waiver to the Landscaping Design Standard for Broadcast Towers has also been requested.

While a distinction is made between this tower which is being built for private microwave antennas to support railroad operations and those built to support cellular telephone and PCS antennas, LMC Section 27.63.150 requires that the request be reviewed using Chapter 27.68 (Personal Wireless Facilities) for the purpose of zoning review. The review using those criteria follows.

**STANDARDS FOR EVALUATION:**

**Conformity with the Comprehensive Plan.**

1. This request is compatible with principles that seek to preserve neighborhood character while minimizing intrusion as much as possible. Additionally, this broadcast tower will help provide additional infrastructure to support an existing industry with minimal impact upon surrounding properties.

**Preference of site location in accordance with Chapter 27.68.080.**

2. This application is considered a Preferred Location Site under Lincoln Municipal Code (LMC) Section 27.68.080(a)(4) - a site located on a commercially or industrially zoned property.

**Compatibility with abutting property and land uses.**

3. This request is located in the industrial corridor south of West O Street, where the most prominent use is the rail yard and associated rail lines. The large area of the rail yard acts a buffer to the nearest developed properties, which are located along West O Street (these

are commercial and industrial uses). To the south, east and west of the proposed tower site is the rail yard proper. Existing development reflects land uses that historically have been deemed compatible with the railroad, uses that are also compatible with the proposed broadcast tower.

**Adverse impacts such as visual, environmental or noise impacts.**

4. A waiver to the Design Standard for Landscaping for Broadcast Towers is requested due to the proposed location of the tower within the rail yard. Given the nature of the surrounding industrial development in this area, there is no need for screening and a waiver to the landscaping is appropriate.

**Availability of suitable existing structures for antenna mounting.**

5. There are no suitable existing structures in this area to accommodate the necessary antennas.

**Scale of facility in relation to surrounding land uses.**

6. There are lights throughout the yard that are approximately 100' in height. Additionally, there is a water tower northwest of the site in excess of 100' in height.

**Impact on views/vistas and impact on landmark structures/districts, historically significant structures/districts, architecturally significant structures, landmark vistas or scenery and view corridors from visually obtrusive antennas and back-up equipment.**

7. The proposed tower site is located within a capitol view corridor. This application was reviewed by the Capitol Environs Commission with a finding of 'Little or No Adverse Impact'. The report from Ed Zimmer for the Capitol Environs Commission is included as an attachment. Also included is a copy of Figure 62 - Capitol View Corridors from the 1994 Comprehensive Plan. This map is based upon the 1977 Urban Design Plan for Nebraska Capitol Environs, and by reference is included in the 2025 Comprehensive Plan.

**Color and finish.**

8. The tower will have a galvanized finish consistent with LMC 27.68.100.

**Ability to collocate.**

9. The tower is designed to accommodate only those antennas needed for railroad operations and is not designed to accommodate collocation.

**Screening potential of existing vegetation, structures and topographic features, and screening potential of proposed facilities, ground level equipment, buildings and tower base.**

10. The proposed site is in the middle of major rail yard and screening is not necessary.

**Evidence of good faith efforts, and demonstration that a preferred or limited preference site was not technically, legally, or economically feasible.**

11. The proposed site is a Preferred Location Site.

**CONDITIONS**

Site Specific:

1. This approval permits a 143 foot tall broadcast tower with a waiver to the design standard for landscaping for broadcast towers consistent with the plans submitted.

General:

2. Before receiving building permits:

2.1 The permittee shall have submitted 5 additional copies of the plans and the plans are acceptable.

2.2 The construction plans shall comply with the approved plans.

Standard:

3. The following conditions are applicable to all requests:

3.1 Before use of the facility all development and construction shall have been completed in compliance with the approved plans.

3.2 The site plan accompanying this permit shall be the basis for all interpretations of setbacks, yards, locations of buildings, location of parking and circulation elements, and similar matters.

3.3 This resolution's terms, conditions, and requirements bind and obligate the permittee, its successors and assigns.

3.4 The applicant shall sign and return the letter of acceptance to the City Clerk within 30 days following the approval of the special permit, provided, however, said 30-day period may be extended up to six months by administrative amendment. The clerk shall file a copy of the resolution approving the special permit and the letter of acceptance with the Register of Deeds, filling fees therefor to be paid in advance by the applicant.

Prepared by:

Brian Will, AICP  
Planner

# SPECIAL PERMIT NO. 1979

## PUBLIC HEARING BEFORE PLANNING COMMISSION:

July 24, 2002

Members present: Carlson, Newman, Steward, Bills-Strand, Larson, Krieser, Duvall, Taylor and Schwinn.

Staff recommendation: Conditional approval.

This application was removed from the Consent Agenda and had separate public hearing due to a letter received in opposition.

Brian Will of Planning staff submitted a letter in opposition from Ron Sisel.

### Proponents

**1. Steve Clymer** of Olsson Associates appeared on behalf of the **Burlington Northern Santa Fe Railroad**, the applicant. This is an application for a 143' broadcast/microwave tower. This application has been reviewed and approved by the Nebraska Capitol Environs Commission. This application also seeks a waiver of the landscaping. This site is completely within the center of the Hobson Railroad yard and landscaping should not be required.

**2. Rob Strommen**, who has been the lead engineer for the applicant in replacing about an 800 mile microwave system from Galesburg, Illinois, to Alliance, Nebraska, testified on behalf of the applicant. The purpose of this application is part of an update of radios and infrastructure to bring the facilities up to date. The Lincoln site is a three-way system, which then heads south to Kansas City. This will be a major node and will be the hub for this system. This facility is being built to locate on railroad property. This location was selected for a variety of reasons, from cable access to accessibility for crews. It allows the engineering criteria to meet the railroad's very strict standards. This system provides complete safety dispatching and signaling for all trains for the surrounding five-state region.

Steward sought confirmation that this is strictly a microwave tower and that it will not have lights. Strommen responded that the 140' height is well out of range of the airport. It will not be painted and will not be lighted. There will also be no ground lighting attached to the tower.

### Opposition

**1. Ron Sisel**, resident of the Lakeview neighborhood, testified in opposition on behalf of his property rights and the property rights of his neighbors for the peaceful use of their private property. His issue is light pollution from the railroad yard lights. He showed a zoning map of Capitol Beach and the railroad yards. There are over 12 lights that cause a problem for the neighborhood. He showed photographs taken of the properties at Brookside Drive and West "P" Street, demonstrating the glare from lights. He also showed photographs of what the railroad lights do to his trees. This is strictly from railroad overspill. This overspill could be remedied by a 30 degree downward adjustment of the 4 north side lights on each of the 12 towers and the attachment of "eyebrow"

hoods. He also showed photographs of the stars that are washed out by the overspill of business lighting. Sisel requested that these changes to the lighting in the railroad yard be made at this time because there are no existing lighting codes beyond parking lots and recreational fields.

#### Response by the Applicant

**Gary Bunce**, the manager of the telecommunication systems for the applicant, is responsible for this project. He stated that he checked today on the status of Mr. Sisel's request that had been previously submitted to the railroad. His request has been placed with the electrical engineering group for the railroad and forwarded to the engineering group at a higher level. At this time it is still under consideration. It has not been dropped.

Newman inquired whether the applicant has encountered these lighting problems in other communities. Bunce was not aware of any others, but he is a telecommunications engineer rather than electrical engineer.

#### Staff questions

Carlson inquired as to any code requirements to cover this lighting issue. Brian Will of Planning staff stated that there is nothing in the code relative to the lights being discussed. They are in compliance with the code as they exist today.

Carlson wondered whether there are portions of the new Comprehensive Plan which might call for investigation of this issue. Mike DeKalb, Interim Director of Planning, advised that the current code only applies to recreational lighting and parking lots. The Comprehensive Plan does include language on investigating light pollution and glare, and he anticipates that this would be considered during the update of the regulations.

Public hearing was closed.

#### **ADMINISTRATIVE ACTION BY PLANNING COMMISSION:**

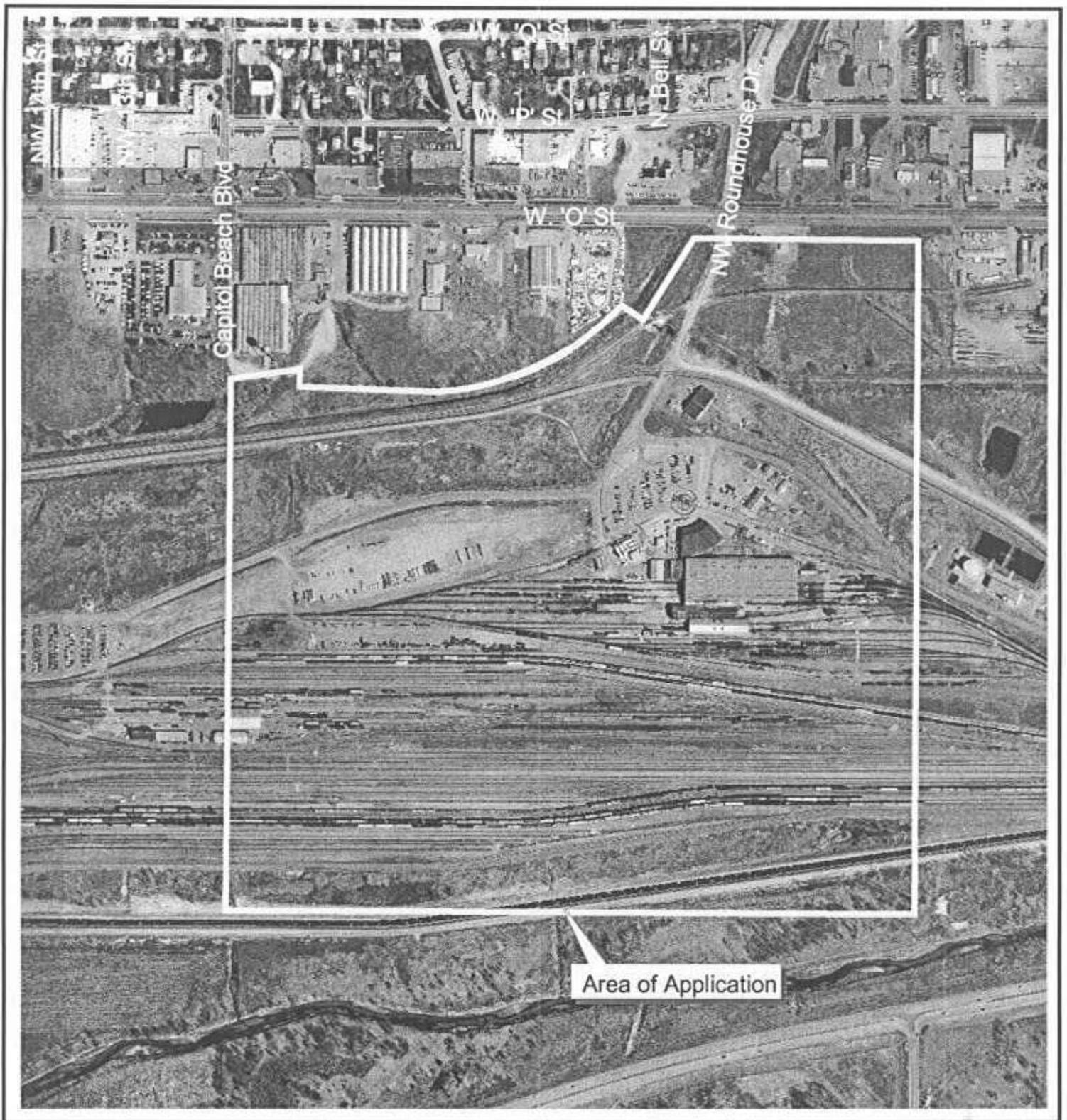
July 24, 2002

Bills-Strand made a motion to approve the staff recommendation of conditional approval, seconded by Larson.

Steward believes Mr. Sisel makes an excellent pertinent point, but not particularly pertinent to this application. This is not the first time that we have had light pollution issues come before the Commission and he would suggest that Mr. Sisel and others in the community which are concerned, as well as professionally qualified on the source of light pollution, put their energies toward helping the Commission with some code revisions at some point in the future because it will become an even greater issue as the community continues to grow.

Schwinn also thanked Mr. Sisel for leading the charge on this and keeping it in the minds of the Commissioners.

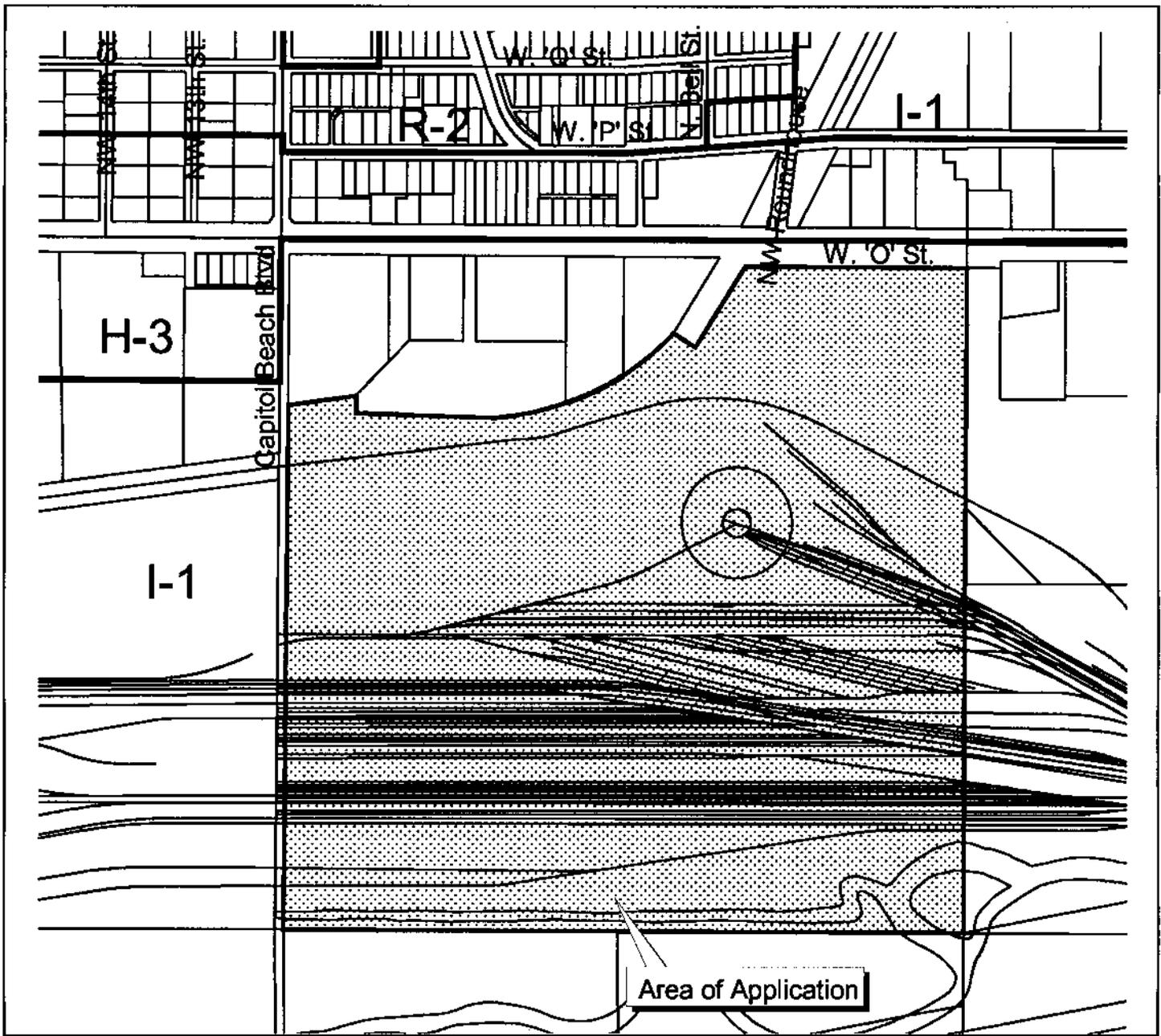
Motion for conditional approval carried 9-0: Carlson, Newman, Steward, Bills-Strand, Larson, Krieser, Duvall, Taylor and Schwinn voting 'yes'.



**Special Permit #1979  
SW 12th & W. 'O' St.  
Broadcast Tower**



008

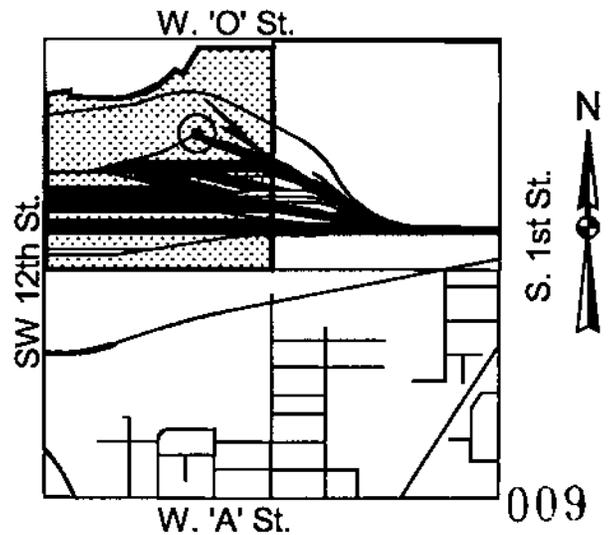
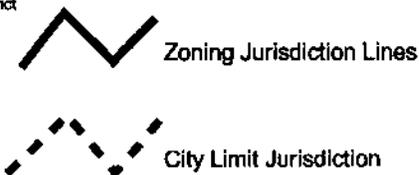


**Special Permit #1979**  
**SW 12th & W. 'O' St.**  
**Broadcast Tower**

**Zoning:**

- |            |  |
|------------|--|
| R-1 to R-8 | Residential District                   |
| AG         | Agricultural District                  |
| AGR        | Agricultural Residential District      |
| R-C        | Residential Conservation District      |
| O-1        | Office District                        |
| O-2        | Suburban Office District               |
| O-3        | Office Park District                   |
| R-T        | Residential Transition District        |
| B-1        | Local Business District                |
| B-2        | Planned Neighborhood Business District |
| B-3        | Commercial District                    |
| B-4        | Lincoln Center Business District       |
| B-5        | Planned Regional Business District     |
| H-1        | Interstate Commercial District         |
| H-2        | Highway Business District              |
| H-3        | Highway Commercial District            |
| H-4        | General Commercial District            |
| I-1        | Industrial District                    |
| I-2        | Industrial Park District               |
| I-3        | Employment Center District             |
| P          | Public Use District                    |

One Square Mile  
 Sec. 27 T10N R6E



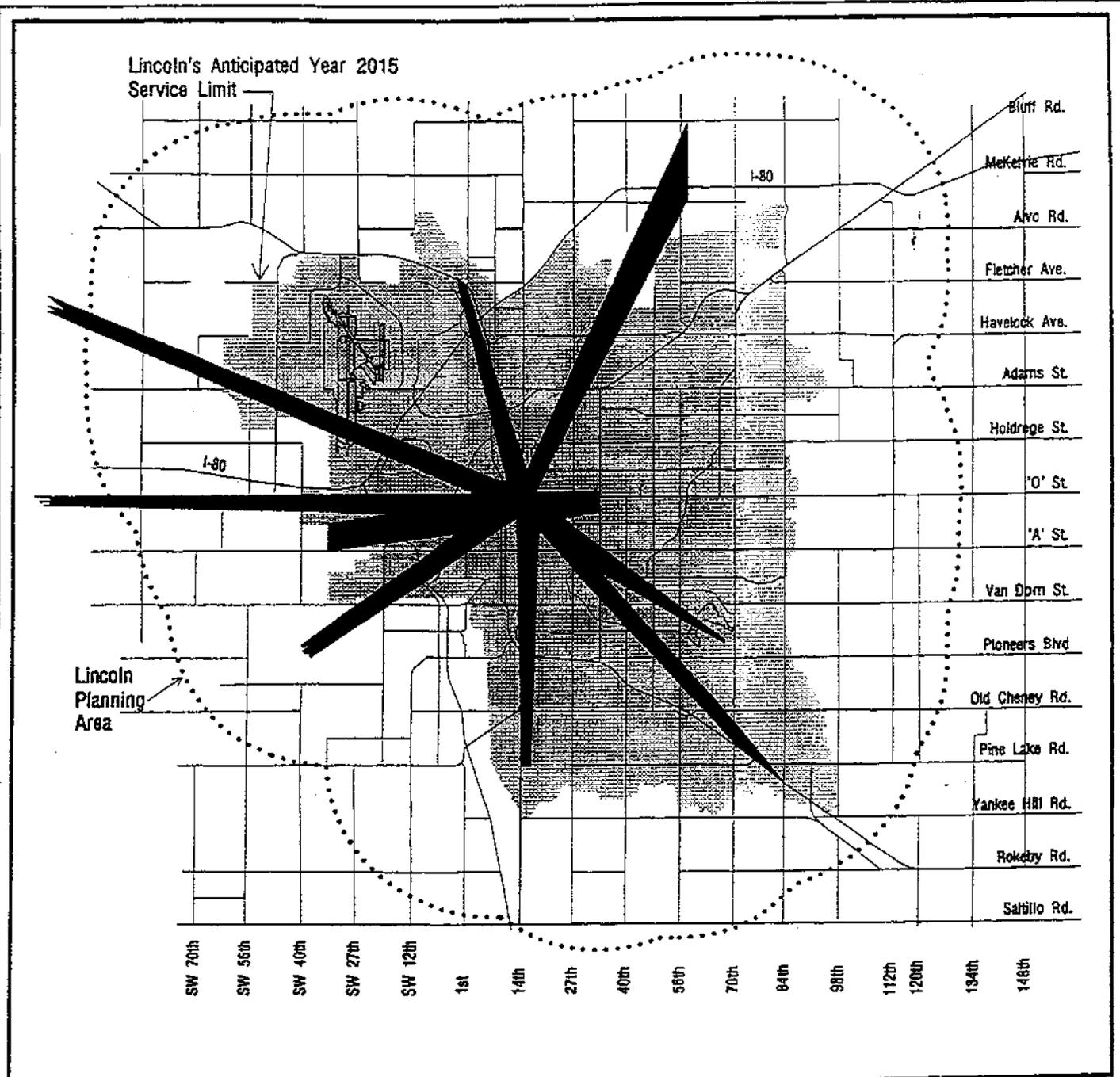


Figure 62

*Capitol View Corridors:  
City Perspective*



■ Capitol View Corridor

**Lincoln City/Lancaster County  
Comprehensive Plan**

010

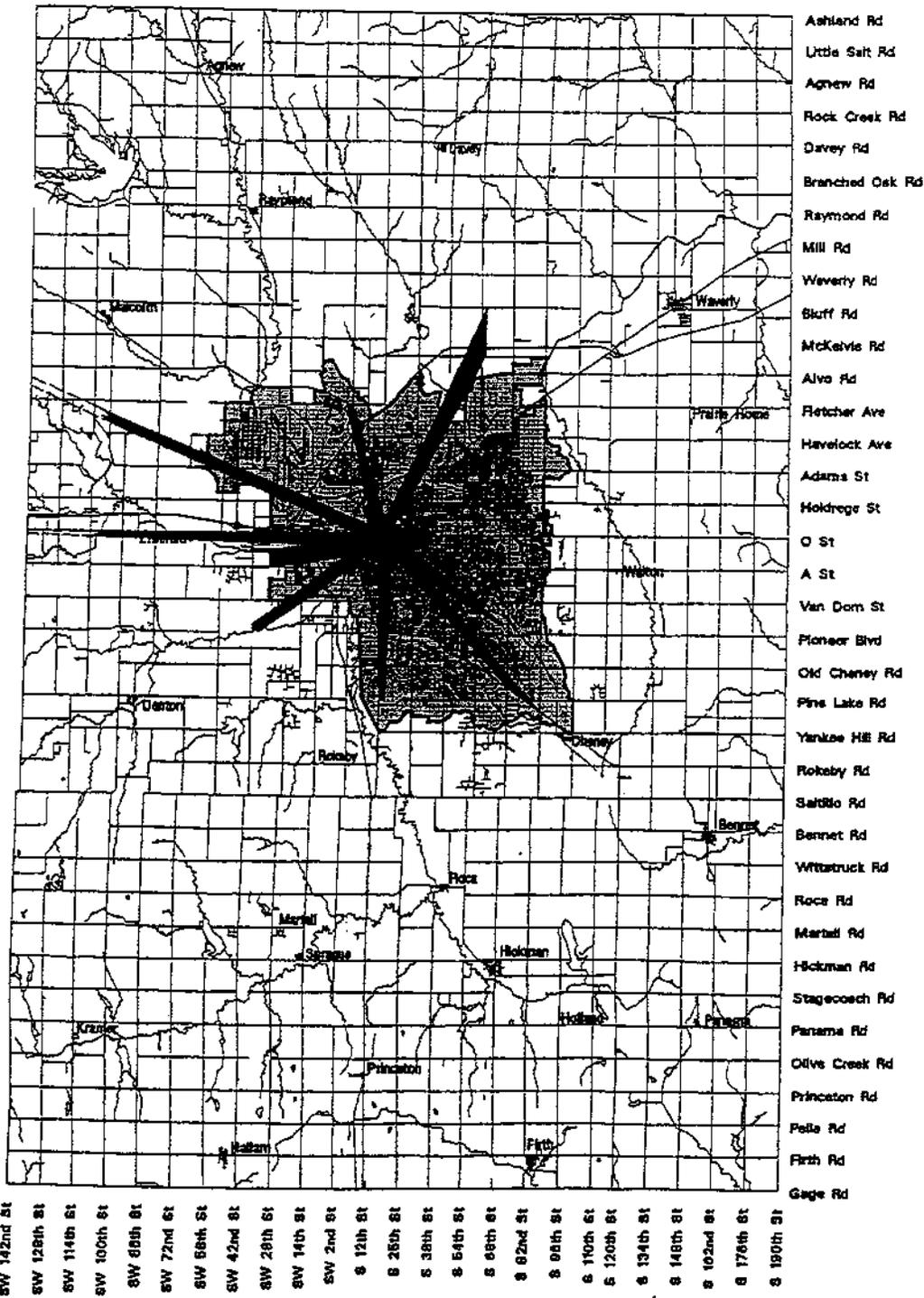


Figure 63  
Capitol View Corridors: County



Lincoln City/Lancaster County  
Comprehensive Plan

-  Capitol View Corridor
-  Lincoln Year 2015 Service Limit

011

# BNSF MICROWAVE TOWER

## SPECIAL PERMIT SITE PLAN

### ENGINEER & PREPARER

OLSSON ASSOCIATES  
1111 LINCOLN MALL  
LINCOLN, NE. 68501  
PHONE: 474-6311

### OWNER & DEVELOPER

BNSF RAILROAD  
MR. ROB STROMMEN  
4515 KANSAS AVE.  
KANSAS CITY, KS 66106  
PHONE: (913)551-4616

### LEGAL DESCRIPTION

LOT 109 I.T. LOCATED IN THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 10 NORTH, RANGE 6 EAST OF THE 6TH P.M. CITY OF LINCOLN, LANCASTER COUNTY, NEBRASKA.

MAY 01, 2002

### WAIVERS

1. REQUIREMENT FOR REQUIRED LANDSCAPING AROUND THE MICROWAVE TOWER FENCE ENCLOSURE.
2. REQUIRED HEIGHT OF 75' MAXIMUM HEIGHT FOR BROADCAST TOWERS IN THIS ZONING DISTRICT. THIS TOWER WILL BE 143' ABOVE EXISTING GRADE.

### GENERAL NOTES

1. THE SURVEY BASE MAP WAS PREPARED AND PROVIDED BY BNSF RAILROAD.

### APPROVAL

THE FOREGOING SPECIAL PERMIT #1938A WAS APPROVED BY THE CITY COUNCIL RESOLUTION # \_\_\_\_\_ ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 20\_\_

ATTEST: \_\_\_\_\_ CITY CLERK

### PROFESSIONAL ARCHITECT'S CERTIFICATE

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT AS A REGISTERED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF NEBRASKA THESE PLANS MEET THE REQUIREMENTS OF THE CITY ENGINEER'S OFFICE DESIGN REQUIREMENTS.

5/29/02  
DATE

*Stephen L. Clymer*  
STEPHEN L. CLYMER

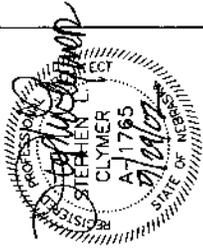
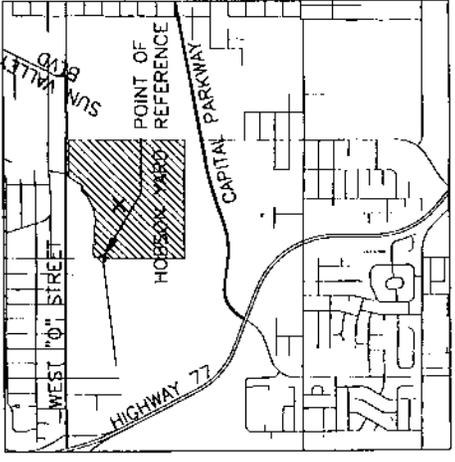
### SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I HAVE CAUSED TO BE SURVEYED THE BOUNDARY OF THE ABOVE PRELIMINARY PLAN AND THAT PERMANENT MONUMENTS HAVE BEEN PLACED OR FOUND AT ALL BOUNDARY CORNERS.

May 29th 2002  
DATE

*Michael R. Johnson*  
MICHAEL R. JOHNSON L.S. NO. 528

### VICINITY MAP



COVER PLAN  
BNSF MICROWAVE TOWER  
SPECIAL PERMIT  
LINCOLN, NEBRASKA  
2002

TWH  
checked by: SLC  
approved by: SLC  
DATE/OC: by: SLC  
project no.: 02-0346  
drawing no.: 200105  
1st submit: 5/29/02

SHEET  
1 OF 4



**OLSSON ASSOCIATES**  
 ENGINEERS - PLANNERS - ARCHITECTS - SURVEYORS  
 1111 WEST 15TH STREET, SUITE 100  
 LINCOLN, NEBRASKA 68502  
 PHONE: 402.476.1000  
 FAX: 402.476.1001  
 WWW.OLSSONASSOCIATES.COM

**LEGAL PLAN**

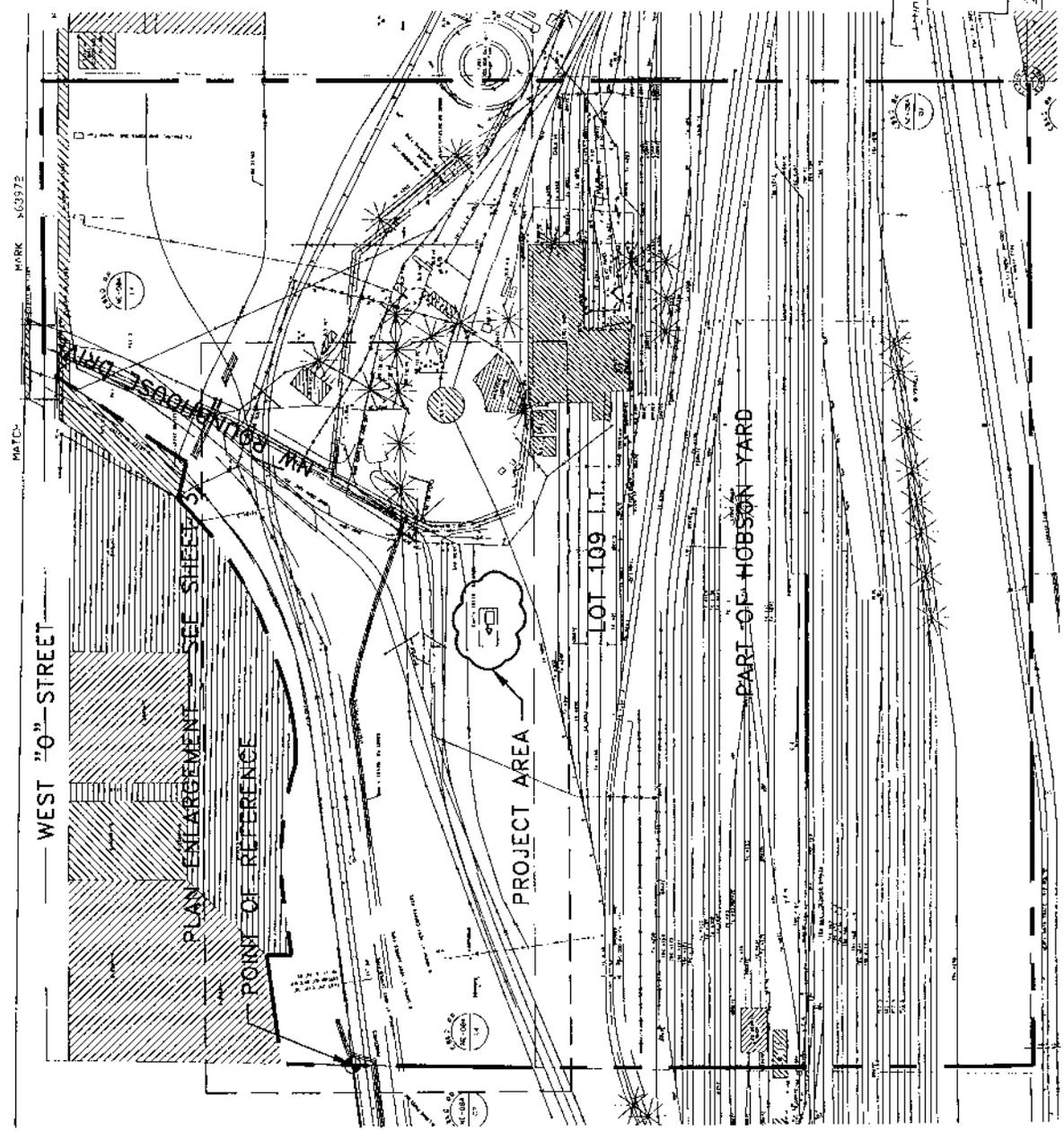
**BNSF MICROWAVE TOWER**

**SPECIAL PERMIT**

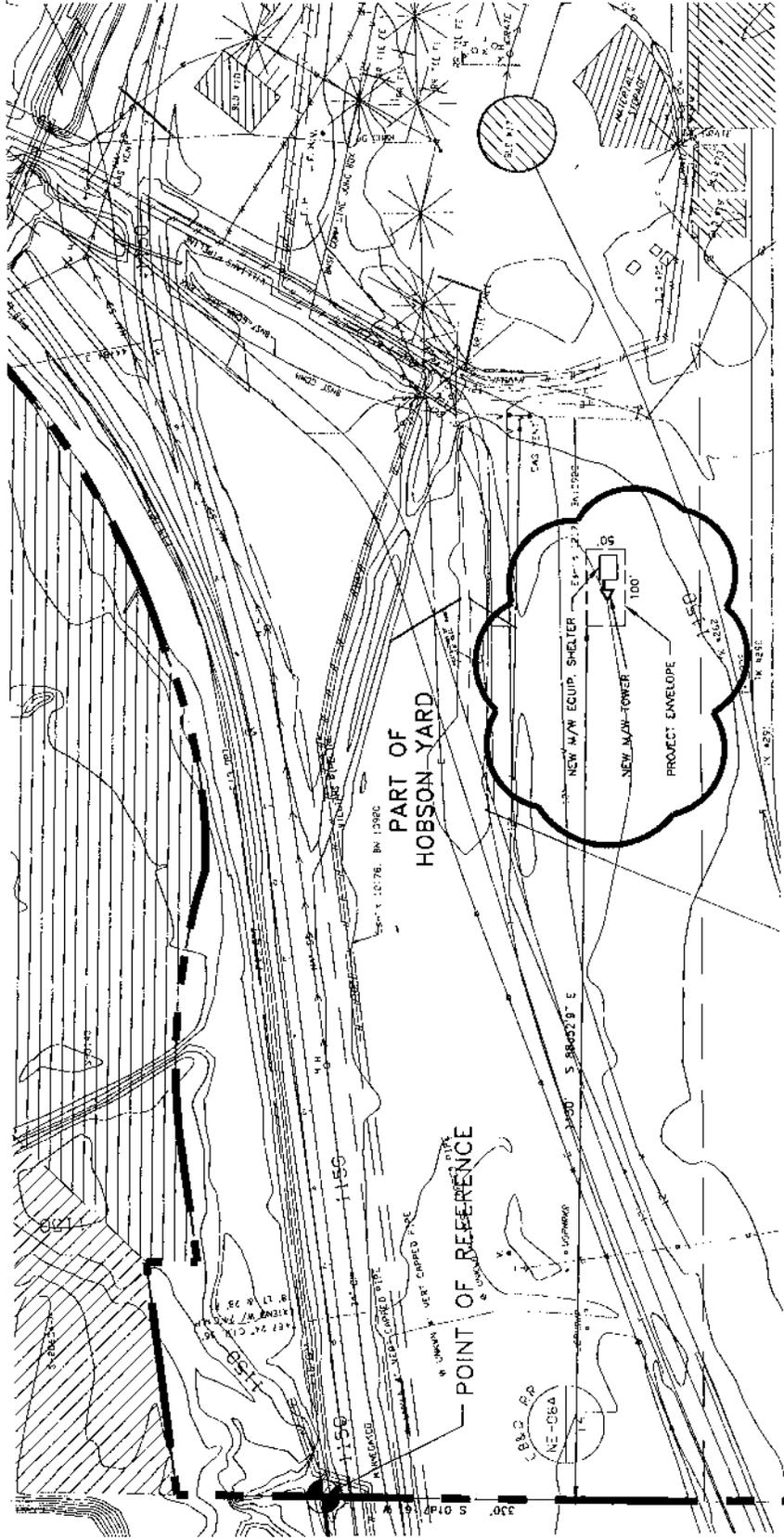
**LINCOLN, NEBRASKA 2002**

drawn by: TWH  
 checked by: SLC  
 approved by: SLC  
 QA/QC by: SLC  
 project no.: 02-0346  
 drawing no.: 200105  
 list submittal: 5/29/02

**SHEET**  
**2 OF 4**

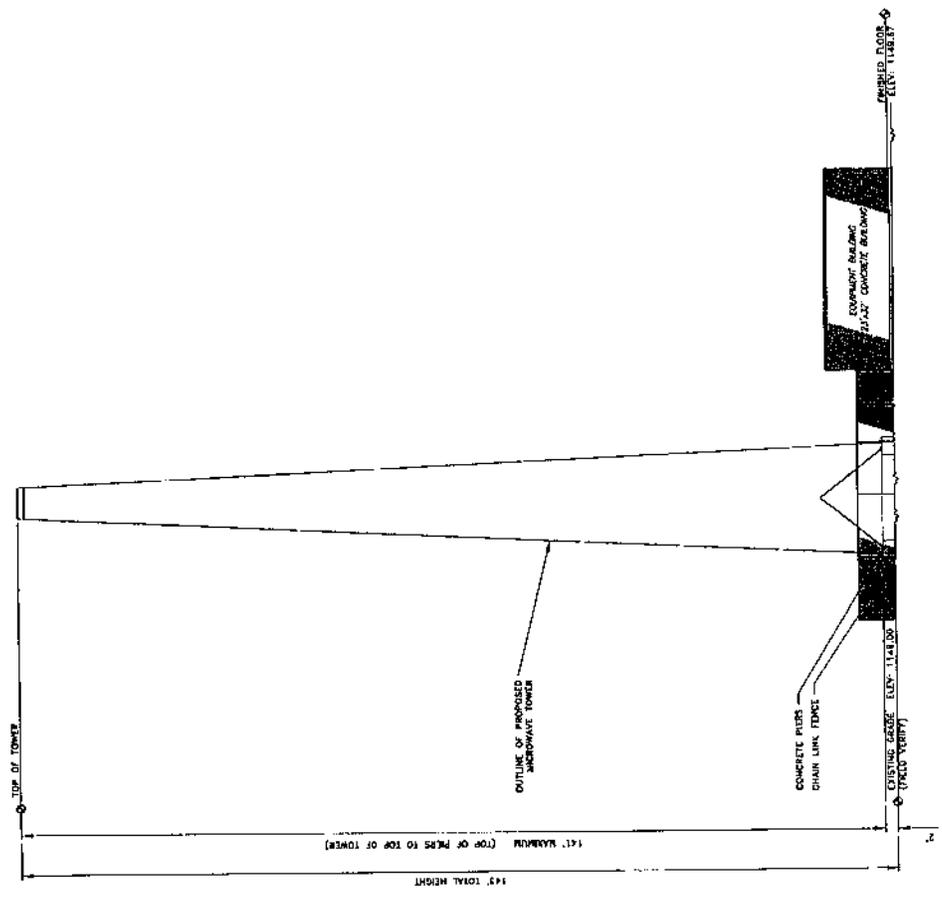


SCALE: 1" = 300'

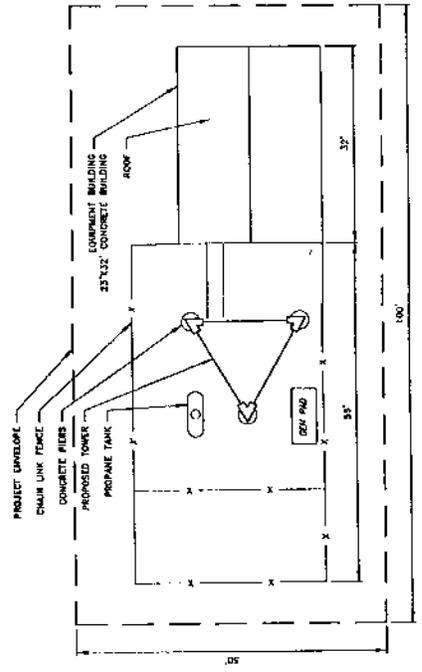


SCALE: 1" = 150'





ELEVATION - TOWER & BUILDING  
SCALE: 1" = 20'



PLAN VIEW - TOWER & BUILDING  
SCALE: 1" = 20'

ELEVATION & PLAN OF  
TOWER & BUILDING  
BNSF MICROWAVE TOWER  
SPECIAL PERMIT  
LINCOLN, NEBRASKA 2002

TWH  
checked by: SLC  
approved by: SLC  
GAY/SC by: SLC  
Project no.: 02-0346  
drawing no.: 200105  
1st submital: 5/29/02

SHEET  
4 OF 4

LINCOLN CITY ENGINEER CO. 444  
PLANNING DEPARTMENT  
MAY 30 2002

OLSSON ASSOCIATES  
ENGINEERS - PLANNERS - SURVEYORS - ARCHITECTS  
1111 14th Street, Suite 100  
Lincoln, NE 68502  
Phone: (402) 426-1111  
Fax: (402) 426-1111  
www.olsson.com

# TELECOMMUNICATIONS, SIGNAL, & STRUCTURES

BURLINGTON NORTHERN SANTA FE RAILWAY  
4515 KANSAS AVE  
KANSAS CITY, KS 66106

**BNSF**



Gary Bunce  
Manager Telecomm Systems  
Phone No. - (913) 551-4616  
Fax No. - (913) 551-4053

May 15, 2002

Honorable City Council  
City of Lincoln, Nebraska

Dear Council:

This letter is provided in addition to the building permit and tower permit applications. The applications are in reference to the install/construction of a pre-fabricated concrete building and a new tower to be located within BNSF Hobson Yard.

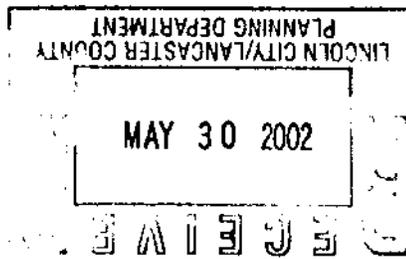
APPLICANT is requesting a new building and tower in order to provide and further enhance communications needs to the surrounding Hobson Yard facilities and to the passing of trains in this area. APPLICANT is requesting a tower height of 140' to insure proper path reliability and clear any path obstructions. APPLICANT is currently upgrading its private microwave system in this region. This particular segment being upgraded expands over 800 miles across three states from Galesburg, IL to Alliance, NE. The system upgrade covers a total of thirty-two (32) sites and provides complete dispatching, telecommunications, and data needs throughout this entire region.

APPLICANT certifies to the planning commission the following:

- 1) It is the owner of the land upon which the undisguised ground mounted wireless communications facility is proposed.
- 2) The new tower structure is NOT located in the flight paths of local airports wherein it would constitute a potential hazard to air safety.
- 3) The new tower is designed per TIA-EIA 222-F, which is the accepted U.S. standard for communication tower design throughout the country.
- 4) The new pre-fabricated concrete building is designed per the 1991 Uniform Building Code, the 1991 Uniform Mechanical Code, and the 1999 National Electric Code. The building design and construction meets or exceeds all requirements to comply with the State of Nebraska. Plans for the building have been reviewed by an outside third party and were found to be in compliance of all building codes. The building will be inspected prior to shipment into the State of Nebraska by an accredited inspector.
- 5) The facility will comply with all federal, state and local rules and regulations.

Sincerely,  
Gary Bunce  
Manager Telecomm Systems

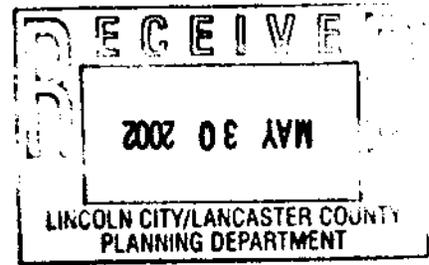
Cc: Robert Strommen (BNSF)  
Joan Darling (Olsson Associates)  
Steve Clymer (Olsson Associates)





OLSSON ASSOCIATES  
ENGINEERS • PLANNERS • SCIENTISTS • SURVEYORS

29 May 2002



Mr. Kent Morgan, Interim Planning Director  
Planning Department  
County-City Building  
555 South 10th Street, Suite 213

Re: Burlington Northern Santa Fe Railway Microwave Tower  
OA Project No. 2002-0346

Dear Mr. Morgan:

Please find the enclosed documents for the above mentioned project:

- A. Drawings (11 x 17 format).
  - 1. Cover Sheet, 11 copies.
  - 2. Legal Plan, 11 copies.
  - 3. Site Plan, 11 copies.
  - 4. Elevation & Plan of the Tower & Building, 11 copies
- B. Ownership Certificate
- C. City of Lincoln Zoning Application for Special Permit.
- D. Letter from BNSF authorizing Stephen Clymer, Olsson Associates, as agent for project.
- E. Letter from BNSF - Applicant Certifications
- F. Application Fee, \$585.00
- G. Site Photographs; 3 sets of 5 photos

Design criteria:

- 1. *Wetlands:* The tower location is not within any designated wetland areas.
- 2. *Tower height:* The tower will be approximately 143' high from grade.
- 3. *Tower use:* The tower will not be used for personal wireless cellular telephone communication. It will be used exclusively for BNSF and is a microwave broadcast tower.
- 4. *Capitol Environs Views:* See enclosed photographs. Note the existing truss-like towers for yard lighting. We have been advised by Norm Bottger, Yard Manager for Hobson Yard, BNSF, that these towers are 100' high. Please note, from the photos, a water tower to the north of our site. We do not foresee significant impact to views of the capitol with the addition of this new tower; especially in light of these other existing adjacent structures.
- 5. *Airport Height Regulations:* The tower height does not violate airport height restrictions.

023

Mr. Kent Morgan

29 May 2002

Page 2

Requested Design Waivers:

1. The maximum allowable height in I-1, Industrial is 75'. Our tower is 143' high from grade. Therefore, we are requesting a waiver to allow a maximum height of 143'.
2. We are requesting a waiver for required landscape screening, as the tower location is within the center of a working railroad yard.

Please call if you have any questions regarding this request for a Special Permit.

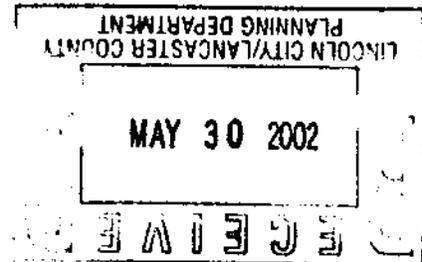
Sincerely,



Stephen Clymer, AIA

cc: Rob Strommen, BNSF

F:\Scratch\steveclymer\bnsf2.wpd



## PLANNING DEPARTMENT COMMUNICATION

TO: **Brian Will**  
DEPT: **Land Use**

DATE: **July 8, 2002** *Ed Zimmer*  
FROM: **Ed Zimmer for Nebraska Capitol  
Environs Commission**

CC: **NCEC Aug. packet**  
DEPT: **Info (HP)**  
RE: **S.P. 1979 by CB&Q RR for  
microwave communication tower  
at Hobson Yard**

Olsson Associates, on behalf of CB& Q Railroad Company, has applied for Special Permit 1979 to install a 143' microwave communication tower in Hobson Yard, within a Capitol vista corridor, south of West O Street and east of Highway 77/Homestead Expressway. The tower would be in the general vicinity of a water tower located south of 1001 West O Street, but the communication tower would be more internal to the railyard, southeast of the water tower.

The Environs Commission discussed the matter under its responsibility to advise the Planning Commission on special permits which may impact significant views of the Capitol. The proposed site is within the area identified as "Country View Corridor 10d" in the 1977 "Urban Design Plan for Nebraska Capitol Environs," which is cited in LMC 27.56 in defining significant view corridors to the Capitol. "Country View Corridor 10d" extends along Interstate 80 from a point about 7 miles west of the Lancaster-Seward County line in an east-southeasterly direction to the Capitol, and encompasses Highway 6/West O Street from approximately Emerald eastward.

The description of this view corridor in the 1977 "Urban Design Plan" notes that in addition to the more distant views, this corridor provides a view of extended duration along the Interstate, where the view aligns with the highway right-of-way for 2½ miles from NW 84<sup>th</sup> to NW 48<sup>th</sup> Streets. There are also significant views of the whole Capitol tower from the elevated portion of Highway 77/Homestead Expressway (formerly West Bypass) between Capitol Parkway West and West O Street, and along West O Street east from about Sun Valley Blvd.

The Environs Commission suggested that staff work with the applicant to analyze the possible impact of the proposed tower, and then report this analysis to the Planning Commission. Members indicated that they were hopeful that the proposed tower would not have adverse impact on significant public vistas to the Capitol, but stated they could not complete an analysis based on the materials provided.

I reviewed additional maps and sketches with Steve Clymer of Olsson Associates, and visited the proposed site with Clymer, as well as viewing it from each of the relevant perspectives. My analysis is that the proposed tower would have little or no adverse impact on significant vistas to the Capitol tower, and my recommendation is that the Special Permit be approved. I will briefly describe the analysis behind this recommendation.

The three public vistas to the tower that I reviewed are:

- 1) Interstate 80 vista, from NW84th to NW48th;

*The tower would be at minimum a few miles distant from the viewer, and south of the line of sight*

*to the Capitol. An unlit, galvanized tower should have little or no impact on this vista.*

2) Homestead Expressway (Highway 77) from the viaduct north of Capitol Parkway West;

*The Homestead Expressway view over the railyard is one of the best mid-range views of the Downtown skyline and the Capitol tower. The relatively flat railyard provides a low and active foreground to the taller distant features. The proposed tower would be north of the best views and would take its place among 100' tall light towers, the water tower, and other "furnishings" of this busy industrial area. Furthermore, the views can only be glimpsed while travelling on the busy roadway perpendicular to the vista. The proposed tower seems unlikely to diminish this viewing opportunity.*

3) West O Street, east from Highway 77 junction.

*Glimpses of the Capitol tower occur periodically along West O, but a continuous vista does not occur until one is considerably east of the proposed communication tower.*

X:\FILES\PLANNING\NCEC\CORRES\Towers\CBQTwr.02.wpd

RE. SPECIAL PERMIT # 1979 - OPPOSITION

RECEIVED  
Plan. Comm.  
JUL 24 2002

DEAR COMMISSIONER:

LINCOLN CITY/LANCASTER COUNTY  
PLANNING DEPARTMENT

REPRESENTATIVE FOR

I AM HERE AS AN INDEPENDENT REPRESENTATIVE FOR THE PRIVACY, PEACEFUL USE AND RELATED PROPERTY RIGHTS OF THE RESIDENTS OF THE OLD "LAKEVIEW" NEIGHBORHOOD. THIS AREA IS WEST "P" ST. (600-1300 BLK.) AND WEST "Q", "R" AND "S" ST.'S (600-2400 BLK.).

THIS AREA SITS ON A RIDGE BETWEEN THE RAILYARD AND CAPITOL BEACH LAKE AND IS 10'-40' HIGHER IN GROUND ELEVATION THAN THE RAILYARD, YET IT IS SUBJECTED TO CONTINUOUS NIGHTLY OVERSPILL LIGHTING FROM 12 LIGHT TOWERS WITHIN THE YARD THAT EQUALS FULL MOON INTENSITY AT RANGES UP TO 800 YARDS.

THIS UNCONTROLLED OVERSPILL IS TOTALLY UNNECESSARY FOR PUBLIC SAFETY OF THE YARD OR SURROUNDING LANDS AND COULD BE EASILY REMEDIED BY A 30° DOWNWARD ADJUSTMENT OF THE 4 NORTH-SIDE LIGHTS ON EACH OF 12 TOWERS AND THE ATTACHMENT OF "EYEBROW" HOODS. THESE CHANGES WILL ONLY RECAPTURE THE 30-40% OF LIGHT CURRENTLY WASTED ON ADJACENT RESIDENTIAL AREAS AND INCREASE ILLUMINATION LEVELS WITHIN THE RAILYARD. THE 40 YEAR OLD LIGHTS THESE TOWERS REPLACED ALL HAD FIXED HOODS.

THEREFORE, I VEHEMENTLY OPPOSE PERMIT 1979 UNTIL SOME LONG OVERDUE SIMPLE ADJUSTMENTS ARE MADE TO BNSF LIGHT TOWERS IN ORDER TO CEASE THEIR MASSIVE, UNCONTROLLED, UNNECESSARY LIGHT OVERSPILL AND TRESPASS ON ADJACENT RESIDENTIAL AREAS.

027

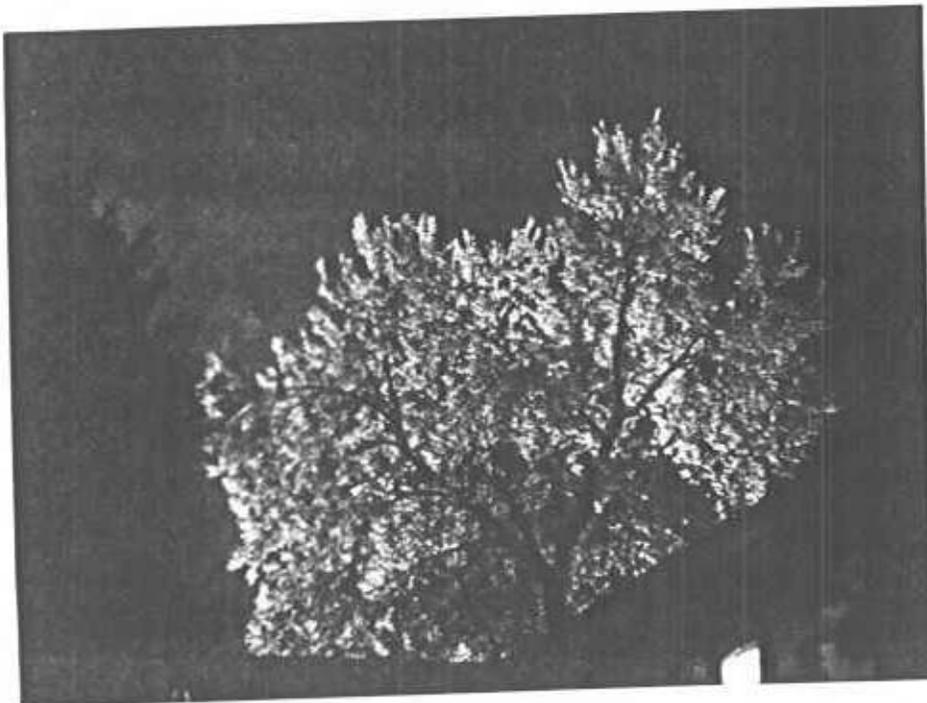
Sincerely,  
Ron Sisel

RON SISSEL, 1010 W. P ST, 415 8543, 416 6581



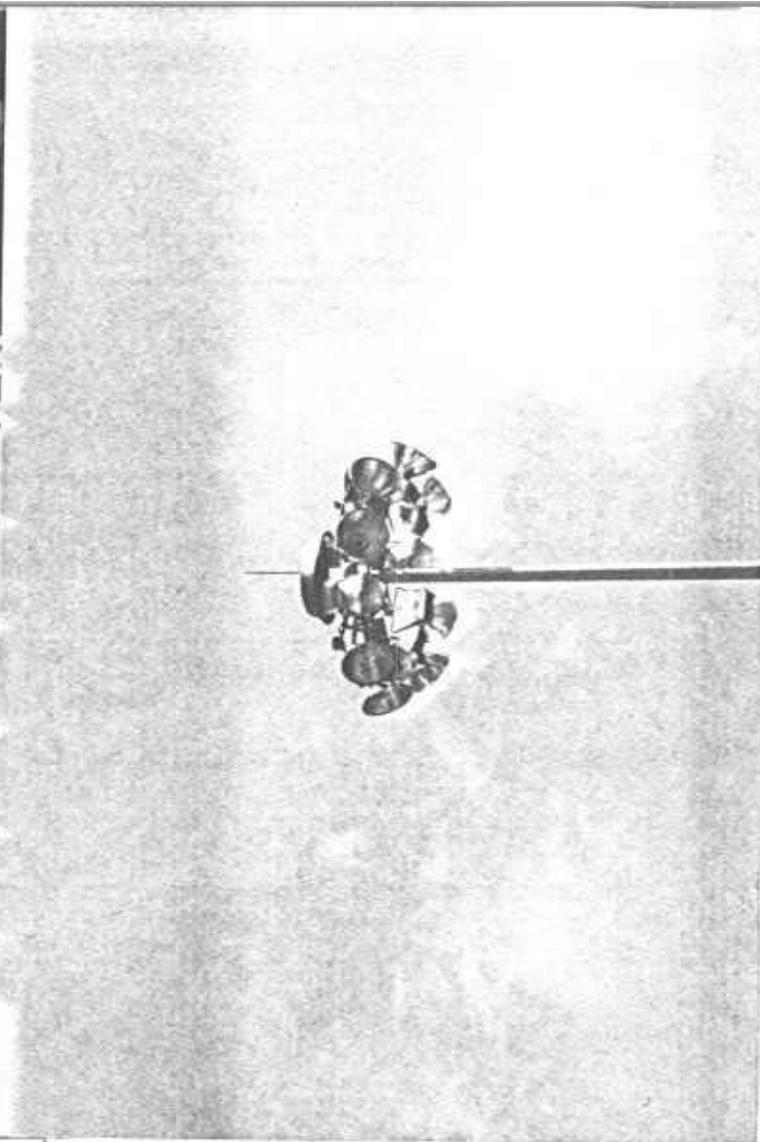
LIT BY ONE TOWER  
400 YDS. TO SOUTH  
(BY DIESEL SHOP)

MIDNITE IN MY YARD  
AT BROOKSIDE AND  
WEST "P" ST.



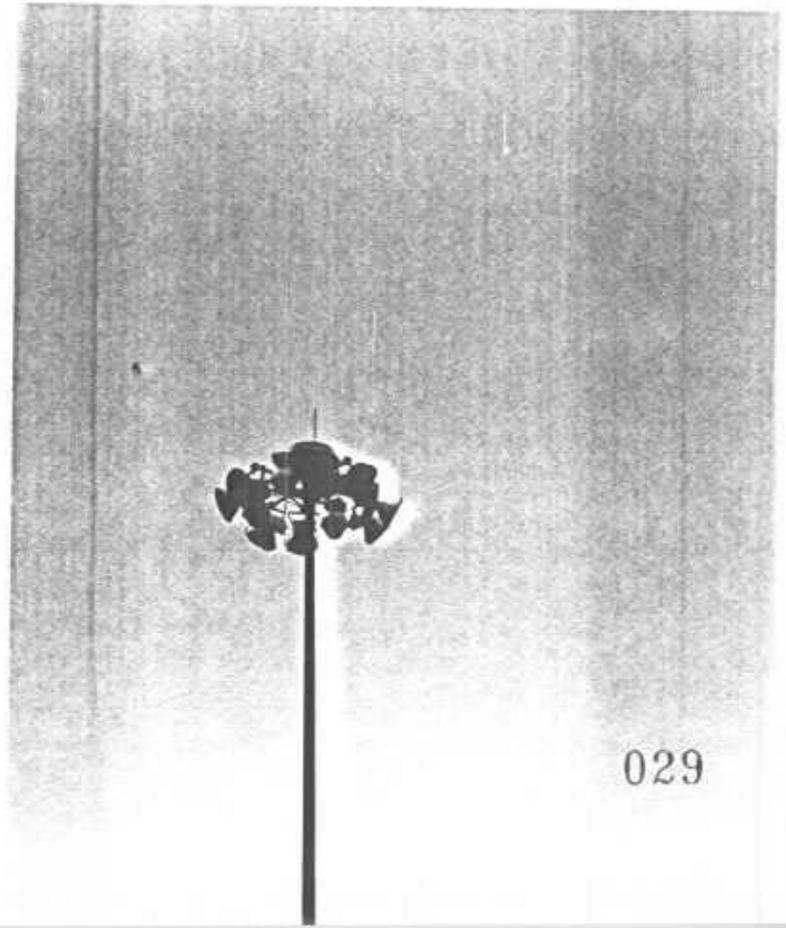
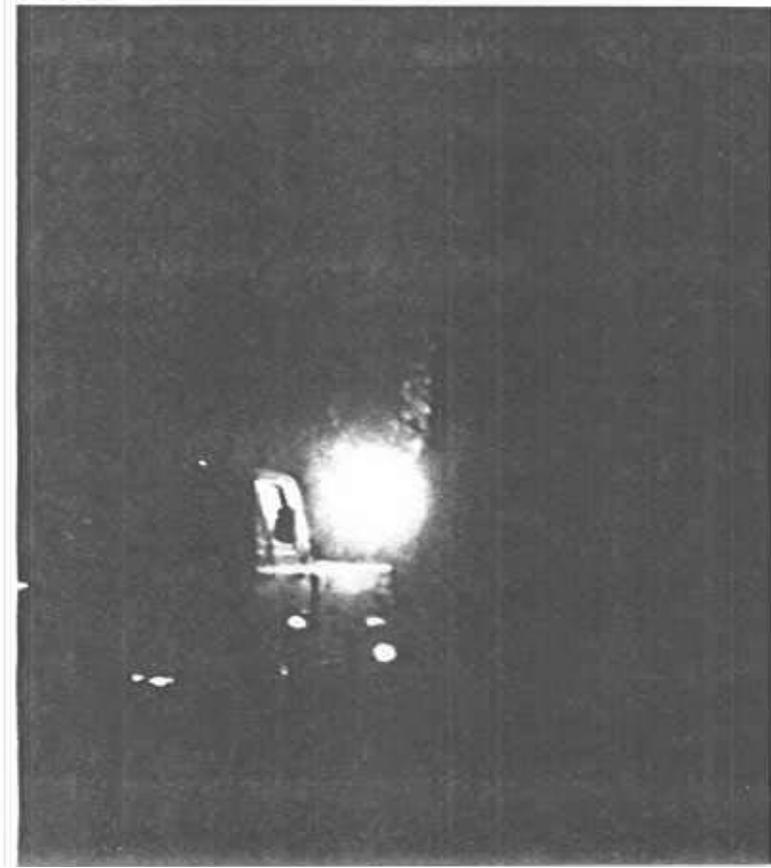
LIT BY MULTIPLE  
TOWERS IN RAIL  
YARDS UP TO  
800 YDS. AWAY

GFD.  
ELEV 30-90' +



TYPICAL ARRAY W/ 2 FINITURES & 1 AREA LIGHT  
SPACINGS. DECLINATION OF 60° REFLECTORS  
APPROX 15°

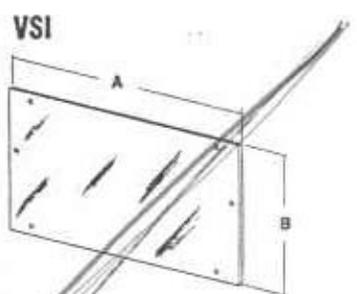
ISOLATED SIGHT LINE TO TOWER  
SEE HEADLINE PHOTO GLARE FIELD



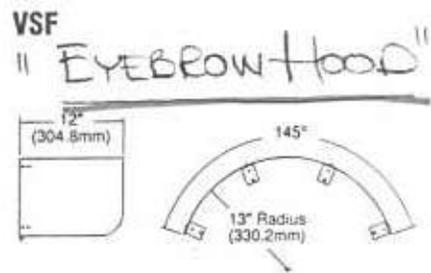


30'  
DROPOFF

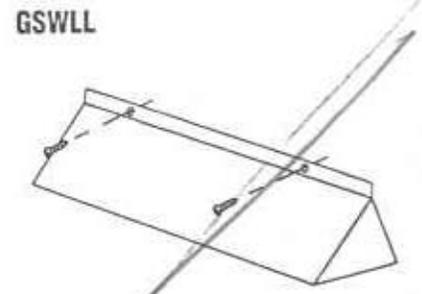
WATER TOWER BETWEEN GLARE FIELDS OF TWO BNSF TOWERS SOUTH AND EAST OF YARD OFFICE. RANGE 500 YARDS. HANDHELD SNAPSHOT (400 ASA). NOTICE GROUND LEVEL OF MY WEST BACKYARD DISAPPEARS EVEN FOR A CAMERA'S VISION.



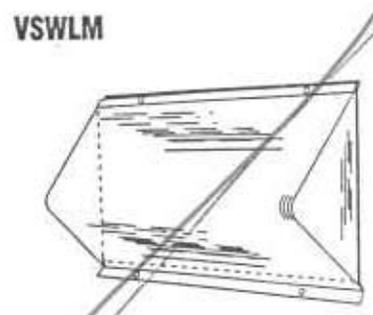
**VSI** Vandal shield for FLI floodlight. 1/4" thick clear polycarbonate, U.V. stabilized. Mounting hardware included. (A=14-15/16", B=9").



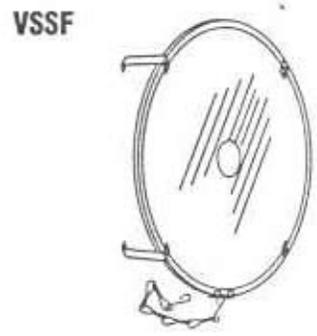
**VSF** Visor for Sports flood. SFG or SFH, rotatable around reflector. Dark bronze finish. Mounting Hardware and safety chain included.



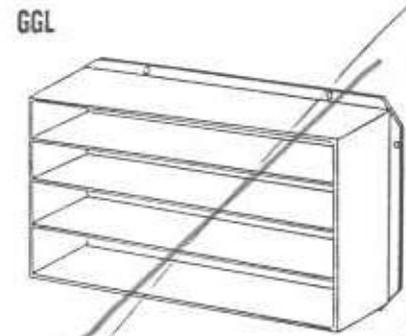
**GSWLL** Glare shield for WLL wall light large 90° cutoff. Dark bronze finish, mounting hardware included.



**VSWLM** Vandal shield for WLM wall light medium. Polycarbonate, U.V. stabilized. Mounting hardware included.



**VSSF** Vandal shield for SFH Sports floodlight. Polycarbonate, U.V. stabilized. Mounting hardware included.



**GGL** External glare guard for FLL floodlights. Dark bronze finish. Mounting hardware included.

COVER LENS - M (FROSTED)

11 Nov 1999

BNSF  
WILLIAM SEEGER  
DEPOT  
LINCOLN, NE.

DEAR MR SEEGER,

Now that construction disruptions have quieted down, I hope you can find some time to fine tune your light towers.

I'm sure they have had a dramatic effect on your yard operations. They have had a couple unexpected side-effects, however.

Now businesses see your luminaires and want brighter, taller, more far-reaching lights in order to "be seen." They use your lights as an example and a cover to vastly overlight their premises and surrounding neighbors even though they have no public safety issues to consider.

I've enclosed two snapshots taken at Brookside Drive and West P street with a ground elevation approx. 40 feet above yours and other surrounding lighting. A single light tower west of the diesel shop (approx. 400 yd. Away) lights the newspaper headline. No less than half a dozen light towers hit the yellow Elm tree from ranges up to 800 yd.

"Light trespass" and over-spill lighting are important quality of life issues, as odor and noise. You could be at the forefront addressing this relatively new issue with minor aiming adjustments and placement of simple hoods or shields. This would put more of the already available light within your property and adjacent public lands while setting a good example for other businesses and returning privacy and peaceful use of surrounding residential properties.

Your consideration of this situation would be greatly appreciated by all of Lincoln's residents.

Sincerely,

Sisel  
1010 West P St.  
Lincoln, NE 68528

NO RESPONSES OF  
ANY KIND TO THIS  
LETTER TO ALL  
THE OFFICIALS  
LISTED.

Sisel

- CC: WILLIAM SEEGER / LN ENG (DIVISION ENGINEER)
- SCOTT MARTIN / ELEZ. (ELECTRICAL FOREMAN - LOCAL MAINT)
- JIM EGGEN / ENG SVC. (ENGINEERING SERVICES)
- DENNIS HARDING / STRUCT. (STRUCTURES - ENGINEERING)
- LARRY MEYER / STRUCT. ( " " )
- JOHN TYBURSKI / DIESEL SHOP SPT. (DIESEL SHOP SUPERINTENDENT)
- DOUG JONES / TERMINAL SPT. (TERMINAL SUPERINTENDENT - LINCOLN YARD)

031

JAN 21, 2002

SCOTT MARTIN  
ELEC. FOREMAN  
BNSF RR  
LINCOLN, NE

P. 1 of 2

DEAR SCOTT:

AS A 26 YEAR RR EMPLOYEE AND 29 YEAR RESIDENT OF THE WEST "O" YARDS AREA, I HAVE A COUPLE OBSERVATIONS I'D LIKE TO SHARE WITH YOU.

THE LAST YEAR I HAVE BEEN HAULING TRAIN CREWS ON ALL SHIFTS AT THE LINCOLN YARD OFFICE. I NOTICE YOU ARE DOING MAINTENANCE ON THE TALL LIGHT TOWERS AT THIS TIME.

IF THE 1000 WATT SPOTLIGHTS HAD OTHER THAN A CLEAR LENS (FROSTED), IT WOULD MINIMIZE MUCH OF THE "GLARE" THE BURNING ELEMENTS GENERATE. GLARE SOURCES INSTANTLY SHUT DOWN THE HUMAN EYE AND CONTROL OF THAT GLARE WOULD GREATLY IMPROVE THE ABILITY OF WORKERS IN THE YARDS TO ACTUALLY "SEE" WITH ALREADY AVAILABLE LIGHT INTENSITIES.

BEYOND THAT I ENCLOSE A PICTURE OF A NEWSPAPER TAKEN NEAR MY GARAGE ON BROOKSIDE DRIVE BETWEEN WEST "P" AND WEST "Q" STREETS. THE LIGHT ON THIS SHOT COMES SOLELY FROM ONE TOWER AT THE NW EDGE OF THE DIESEL SHOP AT A RANGE OF 400 ± YARDS. MY GROUND ELEVATION IS 30' ABOVE THAT OF THE YARDS. THE SHOT IS NOT THAT SENSITIVE (1 SEC, f 1.4, 400ASA, STANDARD PROCESSING FROM WALGREENS). ABOUT 12 TOWERS CAST VISIBLE SHADOWS HERE FROM RANGES UP TO 800 YARDS.

M. SISEL

032

JAN 21, 2002

P. 2 of 2

SCOTT MARTIN

IF YOU DROPPED THE AIM ANGLES OF THE 1000 WATT SPOTS  $15^{\circ}$ - $30^{\circ}$ , MUCH OF THE LIGHT WASTED OUTSIDE OF YOUR PROPERTY AND SURROUNDING UNDEVELOPED LANDS WOULD THEN RAISE ACTUAL INTENSITIES WITHIN THE RAILYARD. YOU COULD TRY THESE TWO MINOR ADJUSTMENTS ON LIGHT STANDS NEAR THE CONTROL TOWER AND I'LL BET YARDMASTERS COULD IMMEDIATELY NOTICE AN IMPROVEMENT IN ACTUAL VISIBILITIES.

I'D APPRECIATE A SHORT RESPONSE TO MY RECORDER AT (402) 475-8543 ANY TIME.

THANKS FOR YOUR CONSIDERATION AND EFFORTS TOWARD A SAFER WORK ENVIRONMENT.

SINCERELY,

M. L. SISEL  
1010 WEST "P" ST  
LINCOLN, NE 68528  
(402) 475-8543 (MSGs.)

NO RESPONSE OF ANY KIND  
RECEIVED FROM MR MARTIN

Sisel

033

M. SISEL

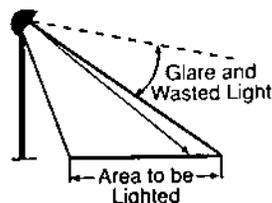
## NEMA CLASSIFICATION

NEMA Type	Horizontal Field Angle*	Protection Distance	Suggested Maximum Aiming Line Separation (X)
1	10°-18°	240' upward	8°
2	18°-29°	200'-240'	12°
3	29°-46°	175'-200'	24°
4	46°-70°	145'-175'	40°
5	70°-100°	105'-145'	60°
6	100°-130°	80'-105'	90°
7	130+	under 80'	120°

\*Formerly Beam Spread

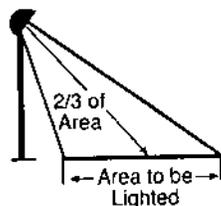
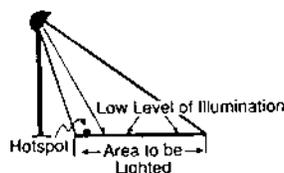
## FLOODLIGHT AIMING

These examples are guidelines for aiming floodlights in typical lighting applications.



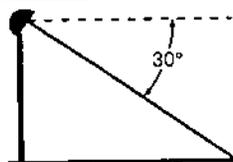
When luminaire is aimed at the far side, light is lost and results in glare.

When luminaire is aimed at the near side, the far side will not receive adequate illumination, while the near side has a hotspot.

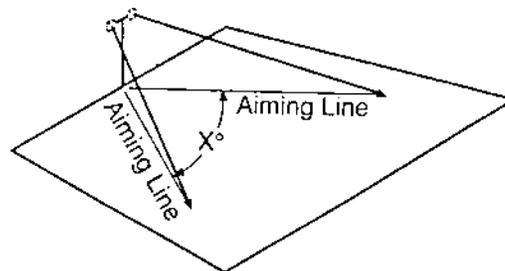
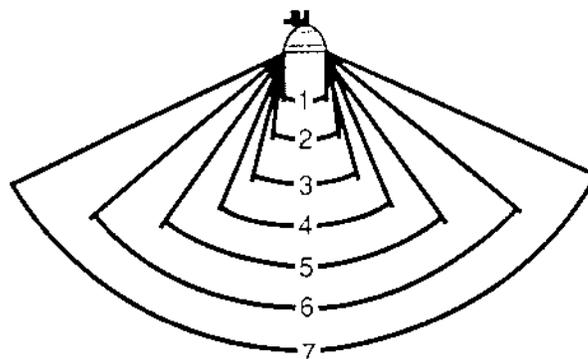


In general practice aim the luminaire two thirds the distance across the area to be luminated, or 2 times the mounting height, whichever is the lower value.

To provide good visual comfort aim luminaire at least 30° below horizontal. Increase mounting height if necessary to get angle 30° below horizontal.



When floodlights are aimed in such a way that the edge of the beam of a given fixture intersects the aiming of the adjacent luminaire, then acceptable uniformity is usually achieved.

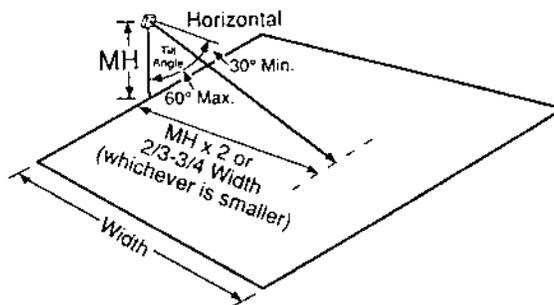


## HORIZONTAL AIMING

NEMA 6 or 7 horizontal beam floodlights will effectively light an area 45° to either side of the aiming line.

For uniform lighting of narrow beam floodlights reduce the separation degrees between aiming line.

Perimeter poles need at least two floodlights per pole to cover the area

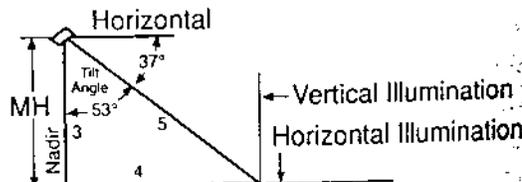


## VERTICAL AIMING

The aiming point should be approximately 2/3-3/4 the distance across the area (width) or twice the mounting height (MH), whichever is the lower value.

For good visual comfort aim floodlight at least 30° below horizontal (or max. 60° tilt angle from nadir).

Higher aiming angles will not improve uniformity and utilization.



The highest horizontal illumination occurs when the maximum intensity (candlepower) is aimed to form approximately a 3, 4, 5 right triangle.

This is useful when determining area lighting pole height or building lighting setback.

---

## International Dark-Sky Association

3225 N. First Ave., Tucson, AZ 85719-2103 USA

ida@darksky.org

http://www.darksky.org

---

# Some Notes on Cutoff Angle and Glare

*by Warren Offutt*

I've been working on light pollution issues in Otero County, NM, for several years. Based upon my experience, the following comments might be helpful.

First, the usual definition of "full-cutoff luminaire" is one that specifies shielding to keep light below a horizontal plane drawn through the fixture itself. Unless one is trying to illuminate objects that are at a higher elevation than the luminaires themselves, full-cutoff fixtures have no deleterious effect on how far the "throw" extends between fixtures. Indeed, full-cutoff fixtures aid, not hinder, the light levels at a distance because the light that formerly was wasted in an upward direction is directed down into the effective area.

Second, knowledgeable lighting engineers today take the position that horizontal plane cutoff is inadequate and best results are obtained with a cutoff angle which is variously 15 to 20 degrees below the horizontal. The reason is that the illumination level fall-off with distance from the fixture shows that broad-distributing "area" illuminating fixtures (i.e., not spotlights) can not render effective illumination at horizontal distances farther than about three times the height of the fixture. Illumination, even if it were isotropic from the luminaire, falls off as the square of the distance from the fixture, and

practical fixtures are not isotropic anyway, further exacerbating the light intensity fall off with distance. At distances farther than about three times the height of the fixture, the illumination level over the working area becomes so uneven and contrasty that illumination farther out is ineffective, regardless of absolute intensities.

There is a practical limit to the differences of illumination level that the human eye can accommodate within the visual field. The three-times-fixture-height rule of thumb, for practical luminaires, corresponds to about a 10-to-1 range in the illumination levels seen by the eye. Making the light brighter does not help, because the eye's iris closes down according to the brightest parts of the scene, causing the dimmer parts of the scene to appear dark. It is elimination of excessive differences of luminance in a scene and the absence of direct glare that make for good seeing.

A distance of three times the fixture height corresponds to a cutoff angle of about 18 degrees below horizontal. When a series of poles is used, spaced at intervals along a roadway, in the far-out extreme of a pole's effective area, there is a contribution to illumination from the next pole, so a slight relaxation of the 18 degree angle is permissible. As mentioned above, 15 degrees is a good working figure.

The use of luminaires designed to these modern standards actually increases (not decreases) the illumination level in the fringes of the working area, because light that was formerly wasted upward is now directed into those areas.

I don't have the increase figures for roadway luminaires, but tests on the standard NEMA head fixtures show a 45% increase in overall illumination level with installation of products like the "Hubbell Skycap", or equivalent. Thus, for the same illumination level in the working area, a lower wattage can be used. Reducing the wattage, of course, means reducing the electric power consumption, all else being equal. For shielded roadway luminaires, the effect will be similar.

An often overlooked fact is that the actual illumination level is only part—and not the most important part—of the matter. The presence or absence of direct glare is more important than the actual illumination level. Witness the difficulty of seeing when driving into a sunset—the illumination level is very high, but seeing ability is poor because of the direct glare from the sun. Oncoming headlights are another example of this. The same principle applies to roadway lighting at night. Glare from distant fixtures is far more harmful to visibility than marginal illumination level. Again, a luminaire which cuts off at about 15 degrees below the horizontal not only concentrates the light within its area of effectivity, but also (more important to good visibility) eliminates glare in the eyes of motorists and pedestrians beyond its area of effectivity. They will be able to see hazards within the effective area much more clearly from a

much greater distance with the elimination of the direct glare.

Everyone benefits from properly shielded luminaires, but special benefit comes to senior citizens and persons with slight sight impairment. Seniors, in particular, experience eyesight deterioration which makes glare difficult to accommodate. Glare impairs their seeing ability much more than a low level of illumination.

Even though an area-lighting fixture can provide effective illumination no farther than about three times the pole height, it can cause harmful glare to a very much greater distance because the glare is a direct ray rather than being reflected off intervening objects such as the roadway, pedestrians, animals, vehicles, or hazards on the road.

The definitive source for recommended light levels is the IESNA—The Illuminating Engineering Society of North America. Their recommendations—upon which most U.S. lighting standards are based—cover virtually every situation for which lighting is needed. However, even their members are just beginning to recognize the importance of direct glare elimination and some of their older publications have not yet been brought up to date in addressing this matter.

*Warren Offutt in an amateur astronomer and retired engineering executive residing in southern New Mexico.*

