Agenda Item #:_____

Staff Report
City of Manhattan Beach

TO: Honorable Mayor Ward and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Richard Thompson, Director of Community Development
Eric Haaland, Associate Planner

DATE: July 5, 2006

SUBJECT: Appeal of Planning Commission Denial of a Sign Exception for Installation of Two Electronic Changeable Copy Signs Above the Entrance to the American Martyrs Parking Garage, Located at 624 15th Street.

RECOMMENDATION:
Staff recommends that the City Council uphold the decision of the Planning Commission denying the subject request.

FISCAL IMPLICATION:
There are no fiscal implications associated with the recommended action.

DISCUSSION:
The Planning Commission, at its regular meeting of April 26, 2006, **DENIED** (3-1, 1 absent) a request for 2 new 25 square-foot electronic wall signs located on a parking structure wall facing 15th Street. The applicant subsequently filed an appeal of the Planning Commission's decision of denial, which requires the City Council to act upon the application.

Changeable copy signs, other than a single church or school monument sign, are not permitted by the city's sign code. Changeable copy signs differ from typical fixed-copy signs identifying a business or entity occupying a given location. Changeable copy provides more detailed messages and scheduling information that change frequently. These signs usually attract more attention and have more aesthetic issues than typical signs. The city's sign code (MBMC Chapter 10.72) permits the one existing monument sign with changeable copy at the main church building, in addition to one maximum 20 square foot fixed-copy wall sign on each primary building of the church facility. The request therefore also exceeds code allowances for wall signs by proposing 2 wall signs (1 max. permitted), of 25 square feet (20 square feet permitted), on a parking structure (not a primary building).

The applicant had proposed 2 new 25 square-foot wall signs located on a parking structure wall facing 15th Street. The signs are both programmable electronic (LED) message cabinets with a fixed panel across the top reading "American Martyrs Catholic Church". The sign would communicate

messages to 15th Street traffic and people across the street at the church's gymnasium and school facilities regarding various events, activities, and programs. The easterly sign would face directly north and the westerly located sign would face northwest as they occupy opposite sides of an angled point in the parking structure wall.

The Planning Commission may approve an exception to the sign code if a sign proposal meets specified criteria, however it could not find that the proposal would be without detriment to the surrounding neighborhood, is necessary for reasonable use of the church facility, and is consistent with the intent of the City's sign code. The Commission expressed concerns for lighting intensity, safety, and general obtrusiveness of the proposed LED signs. Four members of the public stated concerns for the signs' visual obtrusiveness.

The applicant felt that the signs were an appropriate method of church communication, would be visually screened or limited in intensity, and would be less obtrusive than a conforming monument sign previously located across the street from the proposed location. One letter supporting the proposal was received after the Planning Commission stated its initial concerns at its March 29th meeting. One Commissioner concurred with the applicant and felt the sign exception could be approved with restrictions prepared by staff.

A resolution to approve the signs had been drafted by Staff with conditions limiting the hours, visibility, motion, and brightness, however, the Planning Commission determined that the detrimental effects of the signs to neighborhood aesthetics could not be mitigated by such restrictions. In order to approve the sign exception, the following findings must be made:

A. The proposed sign exception would not be detrimental to, nor adversely impact, the neighborhood or district in which the property is located.
B. The proposed sign exception is necessary in order that the applicant may not be deprived unreasonably in the use or enjoyment of their property;
C. The proposed sign exception is consistent with the legislative intent of this title.

The sign exception process does not require a public hearing and the Planning Commission's decision of denial is reflected in the attached April 26, 2006 Minutes excerpts. A courtesy notice was provided to nearby neighbors in this case since the proposal is within a residential district, and the same noticing has been done for the subject appeal consideration before the City Council. Staff reports and additional draft Minutes excerpts from the Planning Commission's proceedings are also attached to this report for reference.

ALTERNATIVES:
The alternatives to the staff recommendation include:

1. **CONDUCT** the appeal proceeding and **UPHOLD** the Planning Commission's **DENIAL** of the sign exception request.

2. **CONDUCT** the appeal proceeding and **APPROVE** of the sign exception request with appropriate conditions.

Attachments:

P.C. Minutes excerpts, dated 3/29/06 & 4/26/06
P.C. Staff Report, dated 3/29/06 & 4/26/06
Plans & lighting details (separate)

(NAE) – not available electronically

c: Absolute Sign, Inc., Applicant
American Martyrs Church, Property owner

Mr. Warren said that he feels coordinating the signage for the center would be a good idea. He suggested that the pole sign be left at its current size in order to include space for all of the tenants and to include space on the bottom to state "Parking in Rear." He indicated that making the existing sign smaller would not allow enough signage for all of the tenants. He indicated that he would not be opposed to continuing the item in order to address the signage further.

Commissioner Schlager indicated that he would like for the cabinet of the pole sign to be reduced, and he would also like to see the signage for all three businesses cleaned up.

Chairman Simon suggested that the applicant work with staff to determine the limits of the signage that is permitted and to reach a solution that satisfies everyone on the property.

Commissioner Bohner said that he would be more inclined to be favorable towards a smaller cabinet than the existing sign. He indicated that he does not feel that a single sign advertising all of the businesses and nothing else would be very attractive. He said that he would be more supportive of a smaller sign and a clean up of the corner for all three businesses.

The Commissioners indicated that they would want the signage to remain within the permitted guidelines of 90 square feet.

A motion was MADE and SECONDED (Schlager/Lesser) to **CONTINUE** the issue for a Sign Exception Regarding the Retention of an Abandoned Pole Sign at 2100-2118 Highland Avenue to the meeting of May 10, 2006, to allow the applicants the opportunity to work with staff on developing a sign plan for the subject site.

AYES: Bohner, Lesser, Schlager, Chairperson Simon
NOES: None
ABSENT: Savikas
ABSTAIN: None

B. Consideration of a Sign Exception Regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street

Associate Planner Haaland summarized the staff report. He said that the proposal is for two programmable LED wall signs of 25 square foot each to be located on the wall above an existing parking structure entrance facing 15th Street. He said that the proposal is in addition to an existing monument sign and wall signs for the American Martyrs church facility. He said that the intent of the proposed signs is to display messages regarding upcoming events and activities. He indicated that the project requires a sign exception for changeable copy on a sign other than a

church/school monument sign; for a sign to be located on a parking structure; for multiple wall signs on a given structure; for a wall sign area greater than 20 square feet; and for any motion or lighting effects. He commented that the item is not a public hearing; however, the immediate neighbors were provided notice because the property is located in a residential area.

In response to a question from Chairman Simon, Associate Planner Haaland commented that staff has received no comments regarding the proposal from the adjacent neighbors.

In response to a question from Commissioner Lesser, Associate Planner Haaland stated that public school construction and signs are regulated by the school district which has its own process for plan review and inspection.

Director Thompson indicated that the State Architect's Office has jurisdiction over construction of schools and hospitals.

In response to a question from Commissioner Lesser, Associate Planner Haaland indicated that private schools and churches are not exempt from the regulations of the Sign Code but are allowed to have changeable copy on a single monument sign. He indicated that signs are regulated by land use and not by the zone in which they are located.

In response to a question from Commissioner Schlager, Associate Planner Haaland indicated that the Commissioners may wish to establish hours that the sign would be permitted to operate. He stated that there has been no formal analysis of safety concerns resulting from the location of the signage above the parking garage.

Mark Byrnes, representing the applicant, commented that the church is subject to all of the City codes, and they went through a very rigorous process of approval for their gymnasium and parking structure. He said that their sign is smaller than the existing Pacific School sign and would not have an impact on the surrounding residents. He said that they would not object to a condition prohibiting scrolling text on the signs. He indicated that they have proposed hours for operation of the sign from 8:00 a.m. to 10:00 p.m. He pointed out that signs are important for churches to inform their congregation of upcoming events. He indicated that the existing monument sign for the church is specifically used to display mass times. He commented that the proposed signs would be in a location across the street from a previously existing sign. He stated that the main problem with the previous sign was that vandals would break into the cabinet, and vandals would not be able to interfere with the proposed signs. He indicated that because of the placement of the signs they would not be visible by any neighbors. He said that the sign is operated by computer, and the text can easily be changed.

In response to a question from Commissioner Schlager, **Mr. Byrnes** pointed out that the previous monument sign located across the street created more of a safety concern because any

driver whose attention was drawn to the sign would look in the opposite direction from cars exiting the garage.

In response to a question from Commissioner Lesser, **Mr. Byrnes** stated that consideration has not been given to upgrading the existing monument sign in front of the church. He commented that the existing monument sign is at a good location for displaying information regarding the church, and the intent of the proposed signage is to display information regarding events for the school and community as well as the church.

Tish Scialampo, indicated that LED is an acronym for light emitting diode, and there is a matrix on all LED signs according to the number of diodes. She indicated that the sign can basically be programmed in any manner that is desired. She indicated that the sign also has an internal regulator to adjust the brightness according to the amount of light outside. She indicated that the signs can be regulated so that the light level is reduced, and it does not emit the same type of glare as a flashlight. She commented that the number of churches, schools and other facilities that are utilizing LED signs instead of traditional fluorescent lighting is increasing in part because of more efficient energy usage. She indicated that the LED signs consume considerably less energy than traditional signs.

In response to a question from Commissioner Schlager, **Ms. Scialampo** commented that the illumination of LED signs are not measured in foot-candles as is other types of lighting. She said that she is not very familiar with the measurement of the radius of light output from LEDs because they are relatively new to the field. She said that she is not certain if the amount of light output reduces over time with LED lighting as it does with traditional parking lot lamps.

In response to a comment from Commissioner Bohner, **Ms. Scialampo** said that the amount of light from the signs could be reduced if there were complaints from nearby residents.

Director Thompson commented that staff can include a condition to address the amount of lighting from the signs from creating an impact to the neighbors.

In response to a question from Commissioner Lesser, **Ms. Scialampo** indicated that the parking structure was chosen because everyone parks in the structure and it would be the most centralized location for the signs.

In response to a question from Commissioner Lesser, Director Thompson indicated that neighbors are typically not provided notice for sign exception applications; however, notice was provided to the surrounding properties in this case.

Commissioner Bohner pointed out that noticing for the proposal was done over and beyond the requirements of the law.

Linda Cohen, a resident of the 600 block of 15th Street, indicated that the signs would be visible from the front of her property. She commented that they would shine into her home.

Carol Wahlberg, commented that a number of residents in the area are parishioners of American Martyrs and would not want to speak out against any proposal being made by the church. She said that the sign would be intrusive, and an electronic sign in a residential neighborhood is inappropriate. She indicated that she felt the previous sign across the street from the parking structure created a distraction and was a hazard to drivers. She commented that it would set a dangerous precedent to begin allowing electronic signs in neighborhoods, and she is troubled that it is felt signage is necessary in order to display messages to school children. She indicated that signage detracts from the beauty of the coastal community. She stated that e-mail is a better method of providing information regarding events than signage.

Commissioner Bohner stated that the signs are excellent in his opinion and he is surprised that the signage on the church campus is so minimal. He said that he does not find the signs to be obtrusive in any manner, and they are directed to the school and restricted from residential areas. He commented that a sign placed at any location in the area would be in the proximity of someone's home. He also pointed out that the lighting level of the signs can be easily adjusted. He indicated that the church has attempted to minimize the exposure to residents. He commented that the proposed signs would basically inform of social activities of the school and church events and would serve a different function than the sign for the church.

Commissioner Schlager stated that precedents are important and a decision made on one project may have a negative effect on the community tomorrow. He stated that LED signs are bright and are quite visible. He said that he appreciates that the church is located in a residential community and the signs would be visible from homes. He said that there could also be a safety concern with drivers looking at the signs located over a parking garage with cars driving in and out and also with children in the area. He indicated that he supports the church and the school, but he is having difficulty in supporting the proposed signs.

Commissioner Lesser stated that a reason that the parish desires an additional message board is because the church is so active with the community; however he is troubled by the proposal. He stated that the Code expressly provides that changeable copy signs are generally prohibited. He indicated that he feels it might be a better option to improve the existing monument sign located near the church rather than to add new signage. He commented that although the signs would be in a location that would limit its visibility by the neighbors, they would still be quite visible even if dimmed. He indicated, however, that he would be receptive to learning more about methods of restricting the illumination so it would not be as invasive to the neighborhood. He also commented that the Sign Code also provides that the purpose of signs is to provide business identification. He said that the church already has a large monument sign to identify itself and

provide information. He indicated that he has a concern that the tradition of allowing churches to have large monument signs might well be exceeded by allowing an LED sign which would be beyond what has previously been in any neighborhood of the City.

Chairman Simon stated that he has a concern that the proposal would establish preliminary rules for the appropriate locations for such signs. He commented that the proposed location of the signs is centralized to the church facility; however, there are residents who would be impacted. He said that there does not seem to be any structure of the proposal by which to base future applications. He indicted that he does not feel he has sufficient information regarding the visibility and brightness of the signs to make a decision. He stated that he has difficulty in supporting the request.

Commissioner Bohner commented that he feels the illumination of the sign is a technical issue that can be mitigated. He said that requirements can be set with the help of staff as to the appropriate amount of illumination. He indicated that he does realize that the signs would be located near residences, but he feels they can be adjusted to be as minimally intrusive as possible. He pointed out that there is a difference in the monument sign in front of the church which is intended to display information regarding services and the proposed signage which is intended to provide information regarding school and community events and information.

Director Thompson commented that it would be appropriate to rule against the project if the Commissioners feel that such signage is simply not compatible with the area. He said that that if the Commission feels that that it may be possible to mitigate the impacts of the signs, staff can draft conditions restricting the brightness, restricting the hours during which the signs are lit, and restricting any scrolling text or motion.

Chairman Simon said that he feels a continuance would be beneficial for him to evaluate in his own mind the appropriate guidelines for such signs.

Commissioner Schlager said that he has a difficulty approving an illuminated sign in a residential area above a garage with cars driving in and out and children walking to and from school.

Commissioner Lesser said that he would want to consider further whether there are other locations that would be less obtrusive to the neighbors. He indicated that he would also like for further consideration to be given to reducing the size of the signs. He said that he also would support a continuance.

Commissioner Schlager commented that Section 10.72020 of the Code prohibits changeable copy signs in general unless a Sign Exception is approved. He pointed out that the decision regarding this proposal can possibly set a standard regarding future projects. He indicated that

he has difficulty approving a sign with illuminated lights within a neighborhood regardless of their brightness. He indicated that he would still be willing to consider the proposed signage with more limitations; however, he is more likely to deny the project.

Chairman Simon commented that it would be helpful to see pictures of examples with similar signs.

Mr. Byrnes said that they would be willing to work with staff to mitigate concerns regarding the signs.

Director Thompson pointed out that the approval of a variance or sign exception by the Commission is made very specific to the subject location so that a precedent is not set. He indicated that each request is considered on an individual basis. He indicated that the findings can be formulated so that it is clear that the Commission is specifically granting approval for the subject signs. He commented that staff will have the Traffic Engineer look at the location of the signs above the garage in terms of creating a safety hazard.

Commissioner Bohner said that a standard can be set as to the illumination that is appropriate and can be conditioned to be as minimally obtrusive as possible. He said that the intent is more for school events. He said that it is not effective on a monument sign for church and school events.

A motion was MADE and SECONDED (Lesser/Bohner) to **CONTINUE** Consideration of a Sign Exception Regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street to the meeting of April 26, 2006.

AYES: Bohner, Lesser, Schlager, Chairman Simon
NOES: None
ABSENT: Savikas
ABSTAIN: None

AT 8:55 a 5 minute recess was taken.

PUBLIC HEARINGS

06/0222.1-1 Consideration of a USE PERMIT, COASTAL DEVELOPMENT PERMIT and VESTING TENTATIVE TRACT MAP 065187 to Allow Construction of a 34-Unit Commercial Condominium Project for Office and Retail Use at 1300 Highland Avenue

Associate Planner Haaland summarized the staff report. He commented that the Commission

stated that based on the fact that the applicant was not willing to make the necessary changes, the Commission directed staff to prepare a Resolution for denial.

Commissioner Savikas commented that the Resolution correctly reflects the discussion at the last meeting.

Commissioner Lesser indicated that it is unfortunate that the applicant chose not to modify their proposal. He stated that it is simply too large for its location at the corner of Manhattan Beach Boulevard and Sepulveda Boulevard. He stated that he supports the proposed Resolution as drafted.

A motion was MADE and SECONDED (Schlager/Lesser) to **ADOPT** the draft Resolution **DENYING** a Use Permit and Variance for a Proposed Sav-on Drug Store at 1100 Manhattan Beach Boulevard

AYES: Lesser, Schlager, Savikas
NOES: None
ABSENT: Bohner
ABSTAIN: Chairman Simon

Director Thompson explained the 15-day appeal period of the item to the City Council.

B. Consideration of a Sign Exception Regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street.

Associate Planner Haaland summarized the staff report. He said that concerns expressed at the March 29 hearing were regarding lighting intensity, safety, and visual obtrusiveness to the neighborhood. He commented that the applicant had submitted further information regarding LED sign lighting and has provided the Commissioners with photos of LED sign examples. He stated that conditions in the draft Resolution for approval of the request include that the signs be screened from sensitive neighborhood views and that new trees or other screening may be required upon installation or in the future. He stated that if the Commission determines that screening is not feasible in every instance that is desirable, it may be appropriate to consider not approving both signs or relocating one or both of the signs to provide better screening. He indicated that there is also a condition prohibiting the sign from using scrolling, flashing and changing of colors. He said that there is also a condition that obtrusive or unsafe brightness be prohibited and that the Community Development Director has the discretion to determine whether the brightness of the signs is appropriate. He commented that a condition that background lighting not be permitted and that the display not be lit to the maximum extent feasible at any time. He stated that the hours of operation for the signs would be limited from

8:00 a.m. to 10:00 p.m. daily and the director would have the discretion to modify the signs to address any complaints that are raised.

In response to a question from Chairman Simon, Associate Planner Haaland said that any decision of the director regulating the signs can be appealed to the Commission.

In response to a question from Commissioner Savikas, Associate Planner Haaland indicated that staff would informally monitor the signs and would respond to any complaints that are received. He said that a decision would be made by the director regarding any actions that would be taken after feedback with the applicant. He said that the decision of the director could be appealed to the Commission if either party objects.

Director Thompson pointed out that an annual site inspection is conducted to make sure there is general conformance with the conditions. He said that staff does rely on residents to come to the City if there are any complaints.

Mark Byrne, representing the applicant, commented that his name was misspelled as "Byrnes" in the March 29 minutes. He stated that they will attempt to address any complaints that arise as a result of the signs. He stated that the signs would be further blocked from the residents along 15th Street as the existing trees near the parking structure grow larger. He said that the signs would be visible from the school parking lot, the school, and the baseball field but would be shielded from the residences on 15th Street. He indicated that they are in agreement with all of the conditions.

In response to a question from Commissioner Lesser, **Mr. Byrne** said that he is not certain whether the parish would consider moving the signs to another location. He indicated that the proposed location was carefully chosen as being the best for visibility at the school while at the same time being screened from the residences on 15th Street .

Tish Scialampo, Absolute Sign, stated that the individual pixels on the signs would never all be lit simultaneously to the maximum intensity of 6,666 NIT's, and there would only be a percentage lit at one time. She commented that she has provided the Commissioners with pictures of several existing LED signs.

In response to a question from Commissioner Lesser, **Ms. Scialampo** indicated that the brightness of a traffic light is 2000 NIT's with all of the pixels being lit simultaneously within a small area, whereas only a portion of the pixels of the proposed signs would be lit at once within a significantly larger area.

Mr. Byrne pointed out that there is a condition included in the proposed resolution that only 25 percent of the LED display may be lit at one time.

Ms. Scialampo indicated that the computer controlling the signs has the ability to reduce the intensity of the lighting to the amount that is determined appropriate. She said that the intensity could be reduced to as low as 2,000 or 3,000 NIT's.

In response to a question from Commissioner Schlager, **Mr. Byrne** stated that they felt 10:00 p.m. is reasonable for the signs to be turned off because it is before most people go to sleep which would help to mitigate any possible impacts.

Commissioner Savikas commented that although she was not present at the last hearing, she has viewed the DVD of the previous discussion that took place and has also visited the site.

Dr. Vic Cohen, a resident of 15th Street, stated that the location is an especially dangerous place for a sign designed to gain the attention of drivers. He stated that the site is a very busy location where many cars and pedestrians are trying to cross without a crosswalk, signal, or stop sign. He indicated that people from the gym, the little league field, and the school parking area are constantly darting across, and cars are often double parked on the street. He indicated that the road is barely wide enough for cars to travel in both directions, and there is a curve which requires attention to navigate safely. He commented that the old set of dividing lines on the road along the curve are as visible as the new lines when they catch the light of the afternoon sun, which is confusing to drivers. He said that he would strongly want the Commission to reconsider allowing the signs in such a dangerous site.

Carol Wahlberg, said that she has the same opinion as at the last hearing and feels the location is very dangerous for the same reasons as the previous speaker. She commented that she has spoken to several parents with children at the American Martyrs school who do not support the proposal. She stated that it is a dangerous precedent to place such a sign in a residential area. She suggested that the signs possibly be placed inside the parking structure to be visible to the people as they are entering or exiting the structure. She indicated that she feels the proposed location of the signs is entirely inappropriate.

Mr. Byrne stated that there was previously a sign on the other side of the street that was lighted with changeable letters. He said that his understanding is that there were no accidents at the location as a result of the previous sign, and he does not feel there would be a difference with the proposed sign. He pointed out that there is no one in the audience in opposition other than the two residents who have raised issues regarding safety. He pointed out that conditions have been imposed to minimize the impact to the neighbors.

Commissioner Schlager indicated that in order for the Commission to approve the proposal, it must be determined that the sign must not adversely impact the area. He said placing a lighted sign in a residential district is his biggest concern. He indicated that he does not have as large of

a concern that the sign would be a great safety issue, as people today are used to outside distractions while driving. He commented that he does not believe that the church would be deprived or denied unreasonably by not having the signs, and there are other means with which to convey upcoming events. He indicated that he also does not feel that the proposed signs are consistent with the legislative intent of the Code.

Commissioner Savikas indicated that the church is a very prominent part of the community. She stated that the goal is to balance the information that the church wants to convey with minimizing traffic hazards and improving the community appearance. She said that part of the standards for the signs with which the City must adhere are regarding the size, the number, the area of coverage, the lighting, the ability to read the text, and the impact on the community. She commented that the sign is not typical for a residential area and would have a permanent effect on the neighborhood. She indicated that she is concerned with a sign that is lighted and has moving text being placed within a residential neighborhood. She is not sure about the standards by which an unsafe brightness would be measured. She said that not everyone would voice their concerns to the City, and measuring on a complaint basis may not be enough. She said that she has reservations with having a lighted sign in the neighborhood and would more likely support a changeable sign with lights that are not LED.

Commissioner Lesser indicated that there is a desire by the applicant to have a sign to convey upcoming events because they are so active in the community, and the church is very prominent in the community. He commented that the Commissioners received a letter in support from former mayor Walt Dougher, whose opinion he respects. He also complimented the applicant on being forthcoming and being willing to provide the Commission with additional information. He indicated, however, that he does have concerns with the proposal. He pointed out that the Code only allows signs on a primary structure with a maximum allowable size of 20 square feet, and the proposal is for two 25 square foot signs located on an ancillary parking structure. He stated that the Code also states that the purpose of signs is to provide identification. He indicated that the applicant already has a monument sign for identification, and the proposed sign would be secondary signage in order to display upcoming events. He said that changeable copy signs are also discouraged by the Code and are generally prohibited unless a sign exception is granted. He stated that he feels the signs would have a detrimental impact on the neighborhood. He indicated that the Pacific School sign is located within several blocks of the site, which the City had no jurisdiction in approving. He commented that a changeable copy sign changes the character of a neighborhood. He said that he does not believe an exception can be granted due to the applicant being deprived unreasonably in the use or enjoyment of their property, as they already have the use of the monument sign to provide identification. He stated that he feels that there are other alternatives for achieving the applicant's goal such as changing the existing monument sign or placing the sign across the street.

Chairman Simon stated that he agrees with most of the comments of the other Commissioners

regarding their concerns of the signs. He commented that the subject location is surrounded by a residential area; however, the residences are far removed from the area in which the signs would be located. He indicated that he feels the design of the signs is discrete, as opposed to a "Las Vegas" sign, and well designed for the intended use. He stated that signage for churches is typically in a different category because they traditionally utilize signage to advertise their activities, and the applicant has indicated that there is a need for them to better inform their members regarding upcoming events. He commented that he is not convinced that the proposed signs would create a great safety concern, as there has not been a history of accident or safety problems arising from the previous sign across the street. He indicated that any issues of traffic control in the area should possibly addressed in a manner other than by a Sign Ordinance. He stated that he feels he can make the necessary findings to approve the proposal.

Commissioner Savikas commented that the impact would not only be to the immediate neighbors at home but also the residents who would drive by the site and view neon-like signs in the middle of a darkened area where there is not a large amount of street lighting. She said that she is not necessarily opposed to a changeable copy sign at the location but rather to the LED signs.

Commissioner Schlager indicated that he appreciates that the applicant and staff have gone through great lengths to make the project work, particularly with the conditions that have been included. He stated, however, that his largest concern is placing any lighted sign near or close to any residential district.

Commissioner Lesser indicated that he would be favorably disposed towards another application of upgrading the former monument sign that could incorporate some protections against vandalism.

A motion was MADE and SECONDED (Schlager/Savikas) to **DENY** the proposed draft Resolution approving a Sign Exception regarding the installation of two electronic changeable copy signs above the entrance to the parking garage of a church at 624 15th Street.

AYES: Lesser, Schlager, Savikas
NOES: Chairman Simon
ABSENT: Bohner
ABSTAIN: None

Director Thompson explained the 15-day appeal period and stated that the item will be placed on the City Council's Consent Calendar for their review on May 16, 2006.

PUBLIC HEARINGS

06/0426.1 Consideration of a USE PERMIT and COASTAL DEVELOPMENT

CITY OF MANHATTAN BEACH
DEPARTMENT OF COMMUNITY DEVELOPMENT
STAFF REPORT

TO: Planning Commission

FROM: Richard Thompson, Director of Community Development

BY: Eric Haaland, Associate Planner

DATE: March 29, 2006

SUBJECT: Consideration of a Sign Exception regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street (American Martyrs Church)

RECOMMENDATION

Staff recommends that the Planning Commission **ACCEPT** input, **DISCUSS** the subject request, and **APPROVE OR DENY** the proposal.

APPLICANT
Absolute Sign, Inc.
4652 Katella Ave.
Los Alamitios, CA 90270

OWNER
American Martyrs Church
624 15th Street
Manhattan Beach, CA 90266

LOCATION

Location	624 15th Street, between Deegan Pl. & Laurel Ave. (See site location map).
Assessors Parcel Number	4171036040
Area District	II

BACKGROUND

The subject church facility has one existing changeable copy monument sign at its primary church building and a wall sign on 2 of its 3 secondary buildings. The subject proposal for an additional 2 new changeable copy wall signs is not permitted by the city's sign code and therefore requires Planning Commission approval of a sign exception.

DISCUSSION

The submitted plans propose 2 new 25 square-foot wall signs located on a parking structure wall facing 15th Street. The signs are both programmable electronic (LED) message cabinets with a fixed 7.5" panel across the top reading "American Martyrs Catholic Church". The sign would communicate messages to 15th Street traffic and people across the street at the church's gymnasium and school facilities regarding various events, activities, and programs. The easterly sign would face directly north and the westerly located sign would face northwest as they occupy opposite sides of an angled point in the parking structure wall. A similar electronic wall sign exists at Pacific Elementary School approximately 2 blocks away from the subject location. The sign code would permit only a monument sign with changeable copy in that example; however, public schools are not subject to city sign regulations.

Changeable copy signs differ from typical fixed-copy signs identifying a business or entity occupying a given location. Changeable copy provides more detailed messages and scheduling information that change frequently. Movie theaters, flower shops, churches, and schools often have changeable copy signs. Most of these signs have plastic letters that can be manually changed by regular employees. An example of a sign exception approved by the Planning Commission in 1993 for changeable copy is Pancho's Restaurant located at 3614 Highland Ave.

The city's sign code (MBMC Chapter 10.72) permits the one existing monument sign with changeable copy at the main church building, in addition to one maximum 20 square foot wall sign on each primary building of the church facility. The parking structure that would contain the proposed signs has previously been considered an accessory structure, rather than a primary building, since it is for parking purposes only. Changeable copy signs are generally prohibited except for the monument sign allowance for churches, schools, etc.

Applicable Sign Code Provisions:

Section 10.72.050 of the sign code provides the permitted church signs as follows:

Land Use	Sign Type	Maximum Number	Maximum Area	Height	Permitted Projection	Additional Reg' s
Public & Semipublic (Churches, schools,...)	Monument	1 double faced sign per site frontage	20 s.f. per face	6 ft.	None	(E)
	Wall	1 per primary building	20 s.f. each	Top of wall	12 inches	

Additional regulation (E)(referenced above) permits changeable copy for churches as follows:

E. Changeable copy is permitted to be incorporated within one (1) primary monument sign of a public or semipublic site.

General provision 10.72.020(E) prohibits changeable copy signs in general unless a sign exception is approved as follows:

E. The copy of all signs shall be permanently fixed in place in conformance with their corresponding sign permits unless an exception for changeable copy is provided pursuant to the regulations of this chapter.

Section 10.72.080 of the sign code provides for Planning Commission approval of sign exceptions as follows:

Section 10.72.080 Sign exceptions.

On sites where strict application of this chapter creates results inconsistent with the intent of this chapter, the Planning Commission may approve modifications to the requirements of this chapter.

Applicants shall submit copies of a proposed sign program with plans and elevations drawn to scale of all existing and proposed buildings and signs as part of the exception application. Upon receipt of a complete application the item will be placed on the next available Planning Commission agenda.

An application for a sign exception as it was applied for, or in modified form as required by the Commission, shall be approved if, on the basis of the application, plans, and materials submitted; the Commission finds that:

A. The proposed sign exception would not be detrimental to, nor adversely impact, the neighborhood or district in which the property is located. Potential impacts may include, but are not limited to, design;
B. The proposed sign exception is necessary in order that the applicant may not be deprived unreasonably in the use or enjoyment of their property;
C. The proposed sign exception is consistent with the legislative intent of this title.

In granting any such exception, the Planning Commission may impose reasonable conditions or restrictions as deemed appropriate or necessary to protect the public health, safety, and general welfare.

The general intent of the sign code, referenced above, reads as follows:

Section 10.72.010 Purpose and intent.

The purpose of signs is to provide business identification. The location, height, size, and illumination of signs are regulated in order to maintain the attractiveness and orderliness of the City' s appearance; to protect business sites from loss of prominence resulting from excessive signs, particularly pole signs, on nearby sites; to protect the public safety and welfare.

Analysis:

The proposed sign location appears to be the most central to the campus-like layout of the church facility, and the least visible to surrounding residential neighbors. The height of the church gymnasium building, and the depth of the church's school parcel reduce or eliminate visibility from homes to the north, however, some homes would have views of the signs over the school playground area. Homes with the closest view of the proposed signs are to the west along the north side of 15th Street. The westerly facing angle of the west sign allows some visibility from the fronts of neighboring properties as near as approximately 150 feet. Sign exception applications do not require noticing, however, neighboring property owners have been noticed in this case since it involves residentially zoned property. No comments have been received from neighbors regarding the application at this time.

In addition to neighbor impacts, the Planning Commission should also determine if the sign proposal would be visually detrimental to the public. The intent of the sign code includes maintaining the attractiveness and orderliness of the city's appearance, and protecting the public safety and welfare.

Staff also has a concern for motion and brightness in the proposed signs. In addition to the identified code conflicts of changeable copy, sign quantity, sign size, and signs being located on an accessory structure, the sign code also prohibits all "revolving, flashing, fluttering, spinning, or reflective signs". These motion oriented effects combined with bright internal lighting would be very visually disruptive. The flexibility provided by a programmable LED sign may have the potential to achieve these effects. The applicant has indicated that the signs will not include any of these effects; however, staff suggests that any approval of the request should specifically prohibit significant motion effects and strong lighting intensity.

CONCLUSION

The sign code permits the Planning Commission to approve a sign exception if it finds that: it would not be detrimental to the surrounding area, is necessary for reasonable use of the property, and is consistent with the intent of the sign code. Staff recommends that the Planning Commission review the proposal and determine whether the electronic signs are a reasonable method for the church to communicate information that will not be visually detrimental to neighbors and the public use of 15th Street.

Staff has provided the attached draft resolution with findings for approval incorporating the reasons discussed above, and conditions requiring reduced secondary signage and increased landscaping.

ENVIRONMENTAL DETERMINATION

Pursuant to the California Environmental Quality Act (CEQA), and the Manhattan Beach CEQA Guidelines, the subject project has been determined to be exempt (Class 1) as minor modifications to an existing facility per Section 15301 of CEQA.

ALTERNATIVES

The alternatives available to the Planning Commission include:

1. **APPROVE** the project with appropriate findings and conditions to be recorded in a minute action.

2. **DENY** the project subject to public testimony received, based upon appropriate findings to be recorded in a minute action.

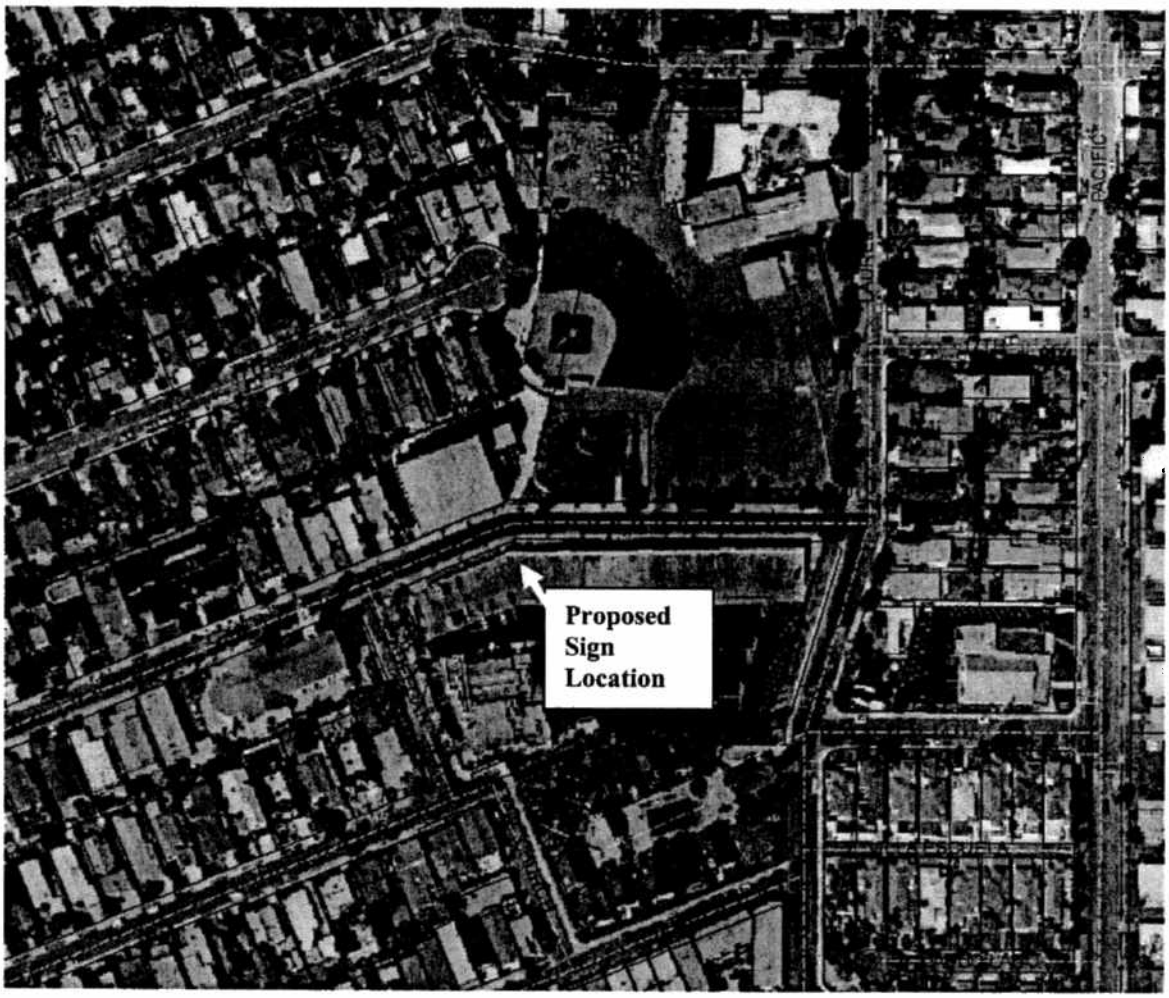
3. **DIRECT** Staff and the applicant as determined to be appropriate.

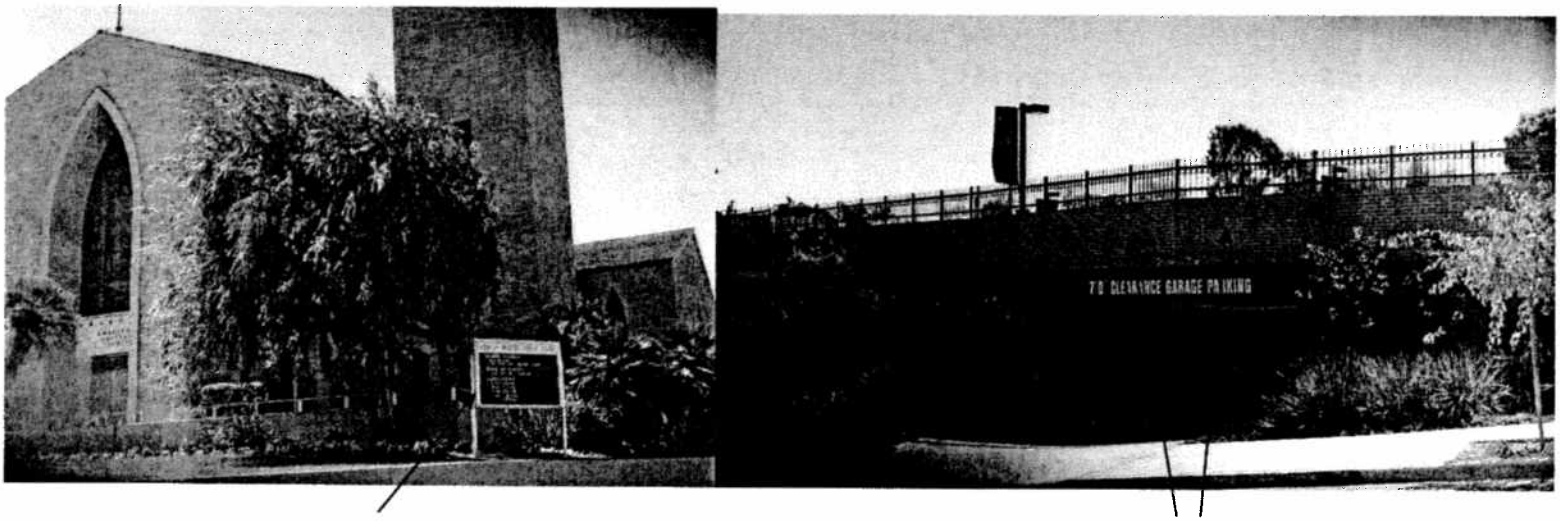
Attachments:
A. Vicinity Map
B. Sign code excerpts
Applicant Material/Plans

cc: , Applicant
, Property owner

Vicinity Map

American Martyr's Church – 624 15th St.





Existing Changeable Copy Sign

Proposed Electronic Changeable Copy Sign Locations

ABSOLUTE SIGN, INC.

1 March 2006

Eric Haaland
CITY OF MANHATTAN BEACH
Community Development
1400 Highland Avenue
Manhattan Beach, CA 90266

Dear Mr. Haaland:

I received an email from Rosemary Lackow indicating that our application was not complete with respect to needing a narrative explaining the projects description. I have put together answers to questions she thought would be helpful. If you find that this is incomplete or you have additional questions, please contact me and I will respond immediately.

The purpose of the sign?
To disseminate helpful and informative news within the parish and the community regarding special events, church activities and community programs.

Why the Church needs this sign?
It is needed to effectively communicate important information.

Why this location?
This location is central to the campus, which includes the Church, school, gymnasium and outdoor activity areas. Most importantly anyone coming to American Martyr's enters here to park.

Number of signs?
It is (1) double face sign, split in half

Location?
It will be located above the entrance to the lower parking garage

Size?
LED Displays – 2'-6" x 6' x 6"
Header – 7-1/2" x 6'-6"

4652 KATELLA AVENUE
LOS ALAMITOS, CA 90720

(562) 592-5838 CALIFORNIA
(800) 898-5444 NATIONWIDE
(562) 592-6198 FAX

WWW.ABSOLUTESIGN.COM
LICENSE #782551

Description of Sign:
Header Panel Copy: White Plex with 3M vinyl overlay – "logos/American Martyrs Catholic Church"
Header Panel Illumination: Fluorescent lamps
LED Display: Amber monochrome capable of (3) lines of 8.27" characters

What types of messages are expected to be displayed?
- Manhattan Beach Youth Basketball Tournament, dates and times
- Manhattan Beach Little League Opening Day Announcement, dates and times
- Holiday Mass Schedules, dates and times
- Pacific School Fashion Show Auction Announcement, dates and times
- Parish Fair Announcements, dates and times
- Time and Temperature

Will there be only words?
Yes

Will the sign have moving copy, bright or flashing lights?
No

What are the expected hours of operation?
8am – 10pm, Monday – Sunday

Will the LED be on a timer or manually switched?
The LED is controlled by a sophisticated software program that does what is programmed into it.
- It can be programmed to turn on and off automatically
- It automatically brightens or dims according to the amount of outdoor light

Are there any other changeable copy signs on other American Martyrs parcels?
No

Replies to comments regarding the code:

"Changeable copy is permitted to be incorporated within (1) primary monument sign of a public or semi-public site".
- American Martyrs does not have an area conducive to a centrally located monument sign with changeable copy
- Having an expensive LED display at ground level may be subjected to vandalism

"One wall sign is permitted per primary building for public or semi-public use". The parking structure is not the "primary building" on the parish hall/church site. It is an accessory parking garage that serves the hall and church.
- This site was chosen for; (1) its central location and (2) its unobtrusiveness. The sign will be located 200' from Laurel Avenue and 100' from Deegan Street.

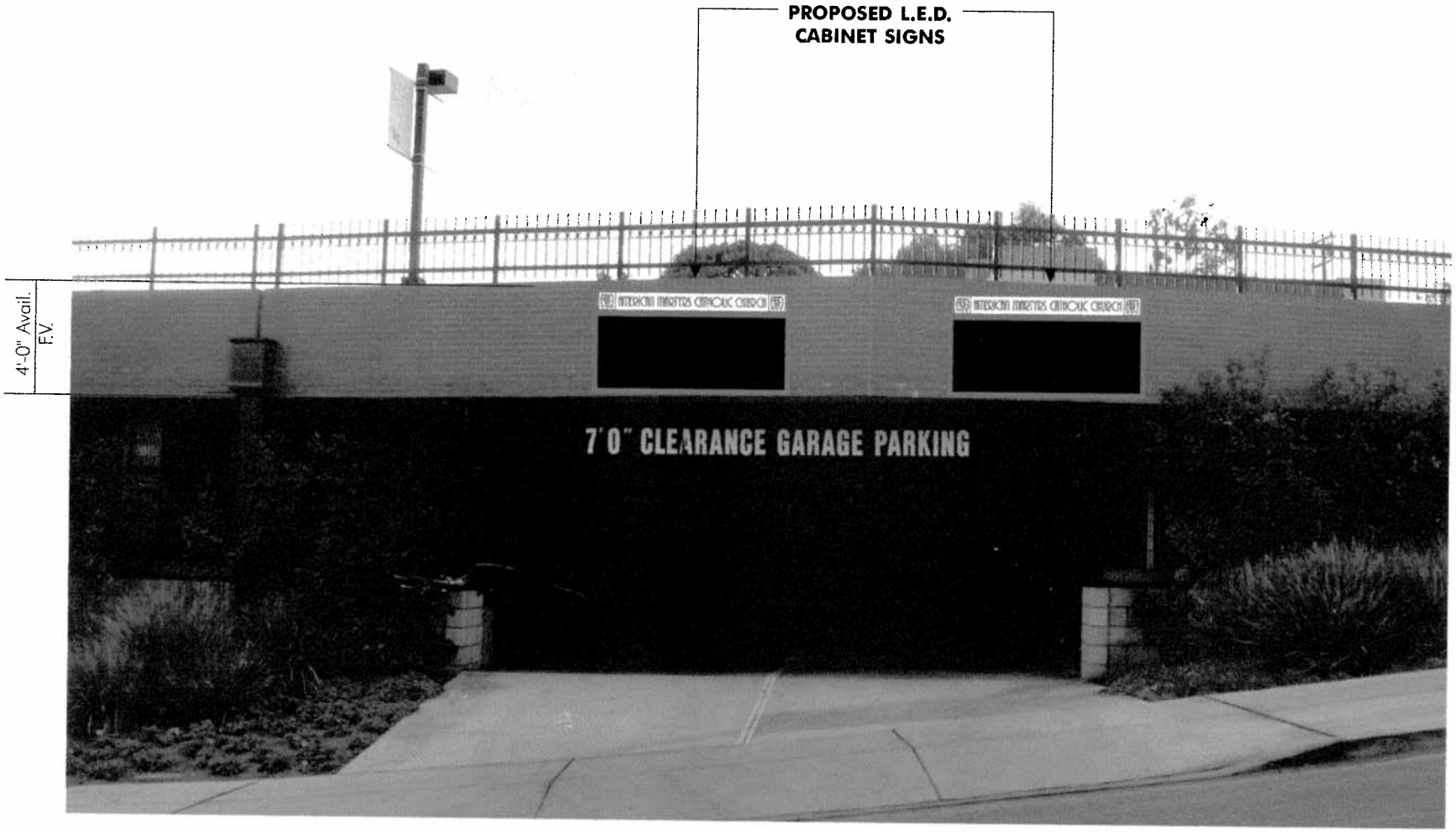
"Paragraph 1 prohibits "flashing" signs"
The sign will not flash

If the sign is not to be placed parallel to and within 1 foot of the wall it would be classified as a "projecting sign"
The wall of the parking garage comes out at an angle and the sign is parallel to that wall. It will project 12" or less from the wall.

I have also included additional copies of the drawings.

Sincerely,

Tish Scialampo
Project Coordinator



PHOTOGRAPH OF GARAGE ENTRANCE WITH PROPOSED SIGNS SUPERIMPOSED

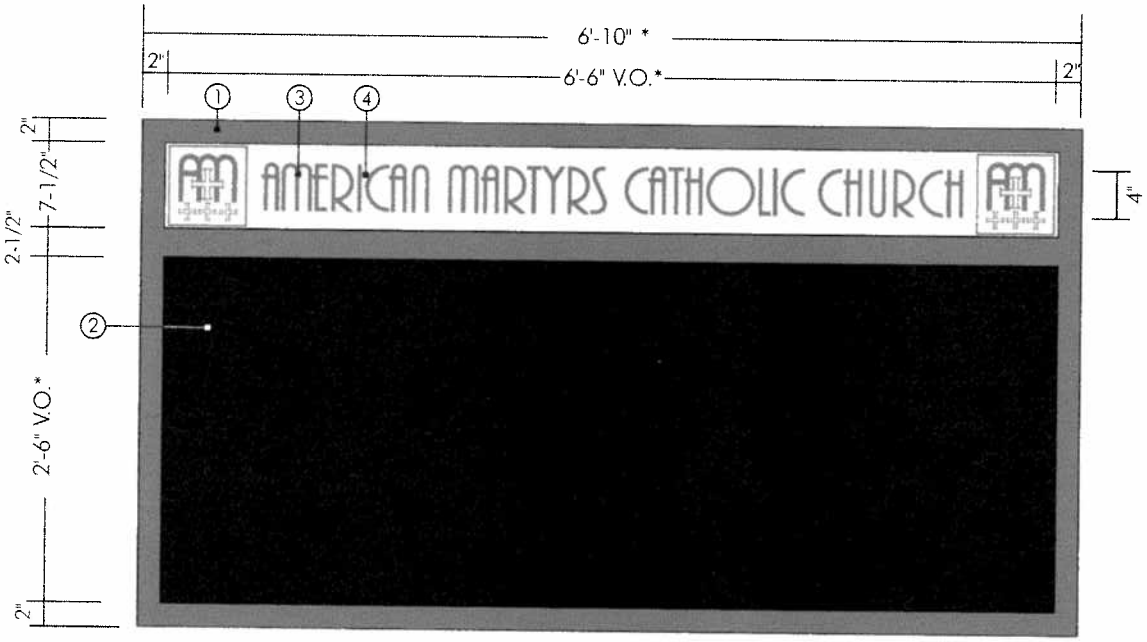
Notes: For illustrative purposes only. Sign sizes in relation to structure is approximate. Field verify adequate space available for signs.

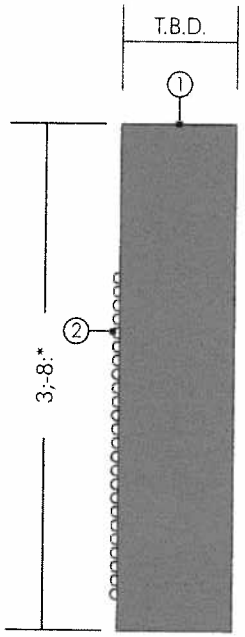
ABSOLUTE SIGN, INC.

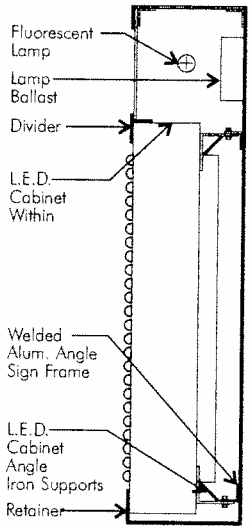
4652 Katella Avenue, Los Alamitos, CA 90720-2626
(562) 592 - 5838 Office - (562) 592 - 6198 Fax
www.absolutesign.com

CLIENT:	American Martyrs Catholic Church		
LOCATION:	624 15th St., Manhattan Beach, CA 90266		
SALES:	Tish Scialampo	**DESIGNER:**	J.W.
SCALE:	Noted **DATE:** 01.24.06	**PAGE :**	1 OF 3

REVISION







L.E.D. CABINET SIGN ELEVATION

PROFILE

SECTION DETAIL

SPECIFICATIONS:

① Single-faced cabinet sign fabricated from aluminum, with aluminum retainer and divider bar.

② Face of L.E.D. sign contained within cabinet.

③ White acrylic panel.

④ Translucent Duranodic Bronze vinyl logo and copy.

* Dimension must be verified, dependent upon actual dimensions of L.E.D. message area.

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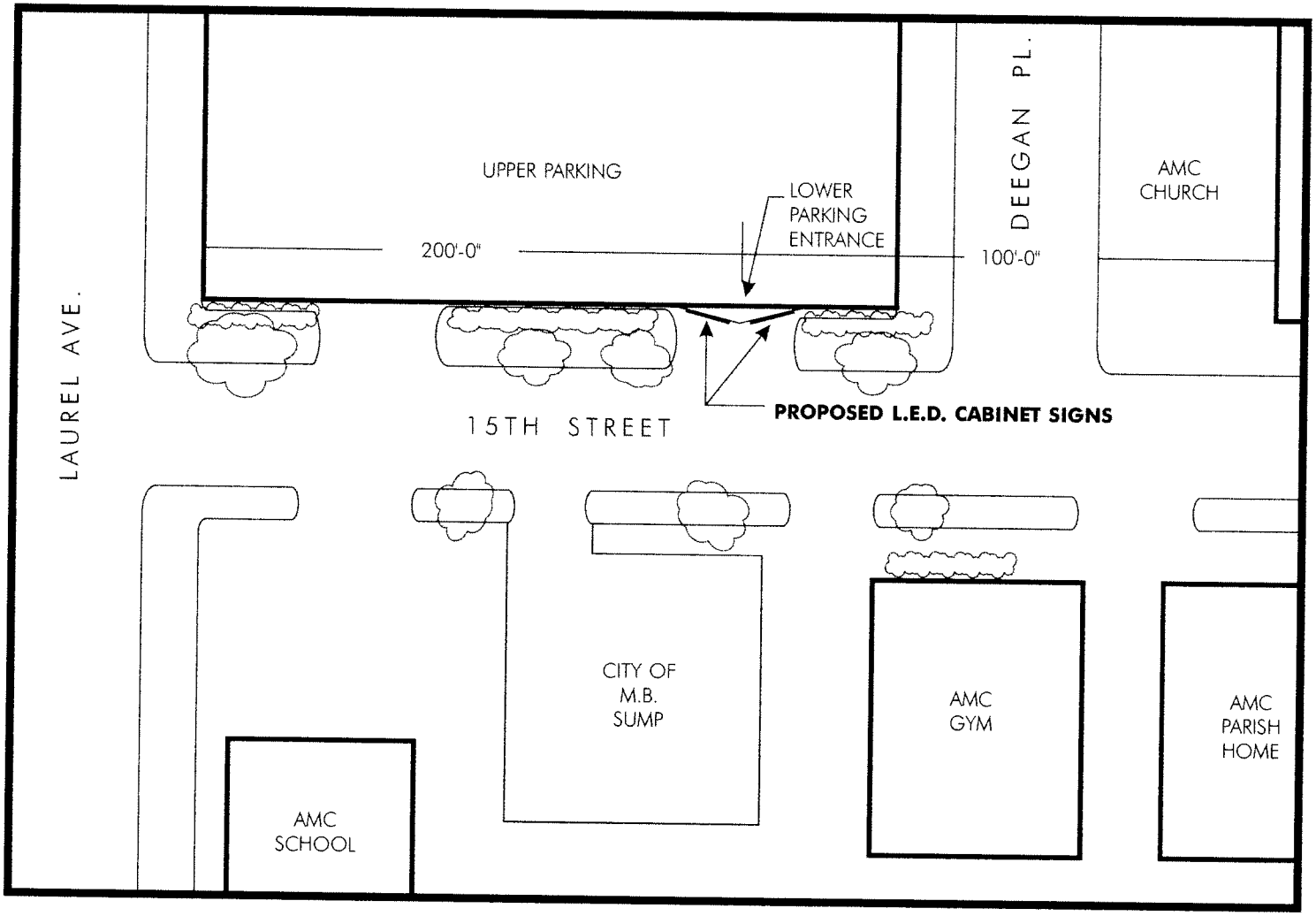
(562) 592 - 5838 Office - (562) 592 - 6198 Fax
www.absolutesign.com

CLIENT: American Martyrs Catholic Church
LOCATION: 624 15th St., Manhattan Beach, CA 90266
SALES: Tish Scialampo **DESIGNER:** J.W.
SCALE: 3/4"-1'-0" **DATE:** 01.24.06 **PAGE :** 2 OF 3

REVISION



SITE PLAN
Not To Scale

ABSOLUTE SIGN, INC.
4652 Katella Avenue, Los Alamitos, CA 90720-2626
(562) 592 - 5838 Office - (562) 592 - 6198 Fax
www.absolutesign.com

CLIENT: American Martyrs Catholic Church
LOCATION: 624 15th St., Manhattan Beach, CA 90266
SALES: Tish Scialampo **DESIGNER:** J.W.
SCALE: **DATE:** 01.24.06 **PAGE :** 3 OF 3

REVISION

CITY OF MANHATTAN BEACH
DEPARTMENT OF COMMUNITY DEVELOPMENT
STAFF REPORT

TO: Planning Commission

FROM: Richard Thompson, Director of Community Development

BY: Eric Haaland, Associate Planner

DATE: April 26, 2006

SUBJECT: Consideration of a Sign Exception regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street (American Martyrs Church)

RECOMMENDATION

Staff recommends that the Planning Commission **APPROVE** the subject request, and **ADOPT** the proposed Resolution.

APPLICANT
Absolute Sign, Inc.
4652 Katella Ave.
Los Alamitos, CA 90270

OWNER
American Martyrs Church
624 15th Street
Manhattan Beach, CA 90266

DISCUSSION

At its regular meeting of March 29, 2006, the Planning Commission considered the subject application, continued the item, and directed staff and the applicant to return with additional information and a resolution addressing the issues raised. The project includes 2 new 25 square-foot LED wall signs located on a parking structure wall facing 15th Street. The Commission expressed concerns for lighting intensity, safety, and general obtrusiveness of the proposed signs. Two members of the public expressed concerns for the signs' visual obtrusiveness at the meeting, and staff subsequently received another neighbor's telephone message stating similar concerns.

The applicant has provided the attached supplemental lighting information that includes background and technical information regarding LED lighting systems. The conclusion of this information is that the brightness of an amber color displayed on the proposed signs would measure 6,666 NIT's (candelas per square meter). This brightness appears to exceed the indicated minimums for text (1,500 NIT's) and video images (5,000 NIT's). A simplistic analogy of this measurement appears to be the brightness of 6,666 candle flames located in a 9 square foot area. The applicant compares this brightness to an LED traffic signal indicated to be 2,000 NIT's.

Staff research of sign lighting standards for other cities primarily found general restrictions against unnecessary and inappropriate glare. Similar research a decade ago resulted in elimination of illumination standards (attached) previously contained in the Manhattan Beach sign code. Those standards were oriented toward conventional plex-face signs. Staff did find the attached regulations for the City of West Hollywood regarding video screens, which primarily address appropriate districts for their use.

The attached draft resolution includes typical and specific findings and conditions for approving a Sign Exception including the following:

Screening: Existing and possibly new trees or other screening devices are required for installation and operation of the signs to prevent objectionable visibility of the signs from surrounding neighbors. If screening, or a distance buffer, for any neighboring properties appears infeasible at this time, the Planning Commission may wish to consider deletion of one sign, or relocation of either sign.

Motion: Scrolling and flashing content is prohibited as discussed, as well as color changing effects that can give a motion-like appearance. Each message screen shown is required to be displayed a minimum of 60 seconds to prevent the perception of motion or speed.

Brightness: Obtrusive or unsafe brightness is prohibited as determined by the Community Development Director. The City Traffic Engineer has indicated that the proposed signs cannot be determined to be a hazard to traffic safety, as they would be a potential distraction similar to many other items (cell phones, radios, etc.) that may distract drivers. The proposed condition allows the Director to require sign adjustments or modifications if any specific safety hazards are identified in the future. The condition specifically prohibits using background lighting effects that would emit a larger quantity of light than lighting the specific text and graphics within a given message. The examples below illustrate a display with a unlit/dark background and lighted text, followed by a display with a lighted/bright background and dark text. The Planning Commission could also limit or prohibit the use of brighter colors such as white, or place measurable (NIT's, candelas, etc.) lighting limits on the signs if brightness is still a concern.

624 15th Street
American Martyrs Church

Proposed Sign Exception for
Electronic Changeable Copy
Signs

General: Hours of operation of the sign are limited to 8am to 10pm daily, and the applicant is required to address neighbor complaints as determined to be appropriate by the Community Development Director.

Findings: A required finding supporting approval of the project states that the signs: will not be detrimental to the neighborhood since the signs are primarily visible from church property and shall be restricted from obtrusive lighting or motion; is necessary for reasonable use of the subject property since the signs can effectively provide information to church members and the community, and is consistent with the intent of the City's sign code in that the signs will not be obtrusive to the neighbors or public and do not result in disproportionately large quantities of sign area for the site considering its large area and quantity of street frontage. An additional finding states that the appropriateness of the proposal is unique in this case due to the signs' isolation from neighboring properties and buffering by the surrounding church campus.

ALTERNATIVES

The alternatives available to the Planning Commission include:

1. **APPROVE** the project and **ADOPT** the attached resolution.
2. **APPROVE** the project and **ADOPT** a revised resolution.
3. **DIRECT** Staff and the applicant as determined to be appropriate.

Attachments:
A. Resolution No. PC 06-
B. P.C. Minutes excerpt dated 3/29/06
C. P.C. Report dated 3/29/06
D. Lighting information
E. Sample video/lighting regs.

cc: Absolute Sign, Inc., Applicant
American Martyrs Church, Property owner

RESOLUTION NO. PC 06-

RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MANHATTAN BEACH APPROVING A SIGN EXCEPTION FOR THE PROPERTY LOCATED AT 624 15th STREET (American Martyrs Church)

THE PLANNING COMMISSION OF THE CITY OF MANHATTAN BEACH DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The Planning Commission of the City of Manhattan Beach hereby makes the following findings:

A. The Planning Commission of the City of Manhattan Beach, on March 29, and April 26, 2006, received testimony, and considered an application for a sign exception for an existing church facility on the property located at 624 15th Street in the City of Manhattan Beach.

B. The Assessors Parcel Number for the property is 4171-036-040.

C. The applicant for the subject project is Absolute Sign, Inc., sign contractor for the owner of the property, American Martyrs Church.

D. Pursuant to the California Environmental Quality Act (CEQA), and the Manhattan Beach CEQA Guidelines, the subject project has been determined to be exempt (Class 1) as minor modifications to an existing facility per Section 15301 of CEQA.

E. The project will not individually nor cumulatively have an adverse effect on wildlife resources, as defined in Section 711.2 of the Fish and Game Code.

F. The property is located within Area District II and is zoned RS, Residential Single-Family. The surrounding private land uses beyond the church facility consist of single-family residences.

G. The General Plan designation for the property is General Commercial.

H. Approval of the sign exception, subject to the conditions below: will not be detrimental to, nor adversely impact, the neighborhood or district in which the property is located since the signs are primarily visible from church property and shall be restricted from obtrusive lighting or motion, is necessary for reasonable use of the subject property since the signs can effectively provide information to church members and the community, and is consistent with the intent of the City's sign code in that the signs will not be obtrusive to the neighbors or public and do not result in large quantities of sign area for the site considering its large area and quantity of street frontage; as detailed in the project staff report.

I. Approval of the changeable copy LED sign request is appropriate in this unique case due to the signs' isolation from neighboring properties and buffering by the surrounding church campus and does not imply that other installations would be appropriate.

J. The project shall otherwise be in compliance with applicable provisions of the Manhattan Beach Municipal Code.

K. This Resolution, upon its effectiveness, constitutes the Sign Exception approval for the subject project.

Section 2. The Planning Commission of the City of Manhattan Beach hereby **APPROVES** the subject Sign Exception for two changeable copy electronic LED wall signs, subject to the following conditions (*indicates a site specific condition):

1. * The project shall be constructed and operated in substantial compliance with the submitted

plans as approved by the Planning Commission on March 29, and April 26, 2006.

2. * Each sign shall not exceed 25 square feet in area or a projection of 12 inches from the attached wall surface. No portion of the signs shall rise above or hang below the wall surface at the proposed location above a parking structure entrance.

3. All wires and cables shall be installed within related structures or underground to the appropriate utility connections in compliance with all applicable Building and Electrical Codes, safety regulations, and orders, rules of the Public Utilities Commission, the serving utility company, and specifications of the Public Works Department. No rough components or finishes shall be visibly exposed.

4. The siting of construction related equipment (cranes, materials, etc.) shall be subject to the approval from the Director of Community Development prior to the issuance of any permits.

5. * Planting or other appropriate visual screening from neighboring properties or identified public street perspectives shall be maintained or installed on church-owned property as determined to be appropriate by the Community Development Director. Existing trees, buildings, structures, or adequate replacements shall continue to provide screening and new trees/structures shall be provided where screening needs are identified currently or in the future.

6. * The use of the LED signs shall be limited to information regarding church and community activities, events and programs. Commercial, personal, instructional, or entertainment oriented content shall be prohibited.

7. * The signs shall display only still-screen messages. Moving, flashing, scrolling, or color-changing copy or images shall be prohibited. Each still-screen message shall be displayed a minimum of 60 seconds.

8. * The sign displays shall not result in obtrusive or unsafe light intensity or glare impacting surrounding properties or public right-of-way as determined by the Community Development Director. As a minimum, use of background lighting effects shall be prohibited, and a maximum of 25% of the LED display shall be lighted at any time.

9. The sign shall be operated only between 8am and 10pm daily.

10. The signs or sign operation shall be modified to address neighbor complaints as determined to be appropriate by the Community Development Director.

11. This Sign Exception shall lapse two years after its date of approval, unless implemented or extended by the Planning Commission.

12. Pursuant to Public Resources Code section 21089(b) and Fish and Game Code section 711.4(c), the project is not operative, vested or final until the required filing fees are paid.

13. The applicant agrees, as a condition of approval of this project, to pay for all reasonable legal and expert fees and expenses of the City of Manhattan Beach, in defending any legal actions associated with the approval of this project brought against the City. In the event such a legal action is filed against the project, the City shall estimate its expenses for the litigation. Applicant shall deposit said amount with the City or enter into an agreement with the City to pay such expenses as they become due.

SECTION 3. Pursuant to Government Code Section 65009 and Code of Civil Procedure Section 1094.6, any action or proceeding to attack, review, set aside, void or annul this decision, or concerning any of the proceedings, acts, or determinations taken, done or made prior to such

decision or to determine the reasonableness, legality or validity of any condition attached to this decision shall not be maintained by any person unless the action or proceeding is commenced within 90 days of the date of this resolution and the City Council is served within 120 days of the date of this resolution. The City Clerk shall send a certified copy of this resolution to the applicant, and if any, the appellant at the address of said person set forth in the record of the proceedings and such mailing shall constitute the notice required by Code of Civil Procedure Section 1094.6.

I hereby certify that the foregoing is a full, true, and correct copy of the Resolution as adopted by the Planning Commission at its regular meeting of April 26, 2006 and that said Resolution was adopted by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

_____
RICHARD THOMPSON,
Secretary to the Planning Commission

_____
Sarah Boeschen,
Recording Secretary

wishes to have a pole sign.

Mr. Warren said that he feels coordinating the signage for the center would be a good idea. He suggested that the pole sign be left at its current size in order to include space for all of the tenants and to include space on the bottom to state "Parking in Rear." He indicated that making the existing sign smaller would not allow enough signage for all of the tenants. He indicated that he would not be opposed to continuing the item in order to address the signage further.

Commissioner Schlager indicated that he would like for the cabinet of the pole sign to be reduced, and he would also like to see the signage for all three businesses cleaned up.

Chairman Simon suggested that the applicant work with staff to determine the limits of the signage that is permitted and to reach a solution that satisfies everyone on the property.

Commissioner Bohner said that he would be more inclined to be favorable towards a smaller cabinet than the existing sign. He indicated that he does not feel that a single sign advertising all of the businesses and nothing else would be very attractive. He said that he would be more supportive of a smaller sign and a clean up of the corner for all three businesses.

The Commissioners indicated that they would want the signage to remain within the permitted guidelines of 90 square feet.

A motion was MADE and SECONDED (Schlager/Lesser) to **CONTINUE** the issue for a Sign Exception Regarding the Retention of an Abandoned Pole Sign at 2100-2118 Highland Avenue to the meeting of May 10, 2006, to allow the applicants the opportunity to work with staff on developing a sign plan for the subject site.

AYES: Bohner, Lesser, Schlager, Chairperson Simon
NOES: None
ABSENT: Savikas
ABSTAIN: None

B. Consideration of a Sign Exception Regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street

Associate Planner Haaland summarized the staff report. He said that the proposal is for two programmable LED wall signs of 25 square foot each to be located on the wall above an existing parking structure entrance facing 15th Street. He said that the proposal is in addition to an existing monument sign and wall signs for the American Martyrs church facility. He said that

the intent of the proposed signs is to display messages regarding upcoming events and activities. He indicated that the project requires a sign exception for changeable copy on a sign other than a church/school monument sign; for a sign to be located on a parking structure; for multiple wall signs on a given structure; for a wall sign area greater than 20 square feet; and for any motion or lighting effects. He commented that the item is not a public hearing; however, the immediate neighbors were provided notice because the property is located in a residential area.

In response to a question from Chairman Simon, Associate Planner Haaland commented that staff has received no comments regarding the proposal from the adjacent neighbors.

In response to a question from Commissioner Lesser, Associate Planner Haaland stated that public school construction and signs are regulated by the school district which has its own process for plan review and inspection.

Director Thompson indicated that the State Architect's Office has jurisdiction over construction of schools and hospitals.

In response to a question from Commissioner Lesser, Associate Planner Haaland indicated that private schools and churches are not exempt from the regulations of the Sign Code but are allowed to have changeable copy on a single monument sign. He indicated that signs are regulated by land use and not by the zone in which they are located.

In response to a question from Commissioner Schlager, Associate Planner Haaland indicated that the Commissioners may wish to establish hours that the sign would be permitted to operate. He stated that there has been no formal analysis of safety concerns resulting from the location of the signage above the parking garage.

Mark Byrnes, representing the applicant, commented that the church is subject to all of the City codes, and they went through a very rigorous process of approval for their gymnasium and parking structure. He said that their sign is smaller than the existing Pacific School sign and would not have an impact on the surrounding residents. He said that they would not object to a condition prohibiting scrolling text on the signs. He indicated that they have proposed hours for operation of the sign from 8:00 a.m. to 10:00 p.m. He pointed out that signs are important for churches to inform their congregation of upcoming events. He indicated that the existing monument sign for the church is specifically used to display mass times. He commented that the proposed signs would be in a location across the street from a previously existing sign. He stated that the main problem with the previous sign was that vandals would break into the cabinet, and vandals would not be able to interfere with the proposed signs. He indicated that because of the placement of the signs they would not be visible by any neighbors. He said that the sign is operated by computer, and the text can easily be changed.

In response to a question from Commissioner Schlager, **Mr. Byrnes** pointed out that the previous monument sign located across the street created more of a safety concern because any driver whose attention was drawn to the sign would look in the opposite direction from cars exiting the garage.

In response to a question from Commissioner Lesser, **Mr. Byrnes** stated that consideration has not been given to upgrading the existing monument sign in front of the church. He commented that the existing monument sign is at a good location for displaying information regarding the church, and the intent of the proposed signage is to display information regarding events for the school and community as well as the church.

Tish Scialampo, indicated that LED is an acronym for light emitting diode, and there is a matrix on all LED signs according to the number of diodes. She indicated that the sign can basically be programmed in any manner that is desired. She indicated that the sign also has an internal regulator to adjust the brightness according to the amount of light outside. She indicated that the signs can be regulated so that the light level is reduced, and it does not emit the same type of glare as a flashlight. She commented that the number of churches, schools and other facilities that are utilizing LED signs instead of traditional fluorescent lighting is increasing in part because of more efficient energy usage. She indicated that the LED signs consume considerably less energy than traditional signs.

In response to a question from Commissioner Schlager, **Ms. Scialampo** commented that the illumination of LED signs are not measured in foot-candles as is other types of lighting. She said that she is not very familiar with the measurement of the radius of light output from LEDs because they are relatively new to the field. She said that she is not certain if the amount of light output reduces over time with LED lighting as it does with traditional parking lot lamps.

In response to a comment from Commissioner Bohner, **Ms. Scialampo** said that the amount of light from the signs could be reduced if there were complaints from nearby residents.

Director Thompson commented that staff can include a condition to address the amount of lighting from the signs from creating an impact to the neighbors.

In response to a question from Commissioner Lesser, **Ms. Scialampo** indicated that the parking structure was chosen because everyone parks in the structure and it would be the most centralized location for the signs.

In response to a question from Commissioner Lesser, Director Thompson indicated that neighbors are typically not provided notice for sign exception applications; however, notice was

provided to the surrounding properties in this case.

Commissioner Bohner pointed out that noticing for the proposal was done over and beyond the requirements of the law.

Linda Cohen, a resident of the 600 block of 15th Street, indicated that the signs would be visible from the front of her property. She commented that they would shine into her home.

Carol Wahlberg, commented that a number of residents in the area are parishioners of American Martyrs and would not want to speak out against any proposal being made by the church. She said that the sign would be intrusive, and an electronic sign in a residential neighborhood is inappropriate. She indicated that she felt the previous sign across the street from the parking structure created a distraction and was a hazard to drivers. She commented that it would set a dangerous precedent to begin allowing electronic signs in neighborhoods, and she is troubled that it is felt signage is necessary in order to display messages to school children. She indicated that signage detracts from the beauty of the coastal community. She stated that e-mail is a better method of providing information regarding events than signage.

Commissioner Bohner stated that the signs are excellent in his opinion and he is surprised that the signage on the church campus is so minimal. He said that he does not find the signs to be obtrusive in any manner, and they are directed to the school and restricted from residential areas. He commented that a sign placed at any location in the area would be in the proximity of someone's home. He also pointed out that the lighting level of the signs can be easily adjusted. He indicated that the church has attempted to minimize the exposure to residents. He commented that the proposed signs would basically inform of social activities of the school and church events and would serve a different function than the sign for the church.

Commissioner Schlager stated that precedents are important and a decision made on one project may have a negative effect on the community tomorrow. He stated that LED signs are bright and are quite visible. He said that he appreciates that the church is located in a residential community and the signs would be visible from homes. He said that there could also be a safety concern with drivers looking at the signs located over a parking garage with cars driving in and out and also with children in the area. He indicated that he supports the church and the school, but he is having difficulty in supporting the proposed signs.

Commissioner Lesser stated that a reason that the parish desires an additional message board is because the church is so active with the community; however he is troubled by the proposal. He stated that the Code expressly provides that changeable copy signs are generally prohibited. He indicated that he feels it might be a better option to improve the existing monument sign located near the church rather than to add new signage. He commented that although the signs would be

in a location that would limit its visibility by the neighbors, they would still be quite visible even if dimmed. He indicated, however, that he would be receptive to learning more about methods of restricting the illumination so it would not be as invasive to the neighborhood. He also commented that the Sign Code also provides that the purpose of signs is to provide business identification. He said that the church already has a large monument sign to identify itself and provide information. He indicated that he has a concern that the tradition of allowing churches to have large monument signs might well be exceeded by allowing an LED sign which would be beyond what has previously been in any neighborhood of the City.

Chairman Simon stated that he has a concern that the proposal would establish preliminary rules for the appropriate locations for such signs. He commented that the proposed location of the signs is centralized to the church facility; however, there are residents who would be impacted. He said that there does not seem to be any structure of the proposal by which to base future applications. He indicted that he does not feel he has sufficient information regarding the visibility and brightness of the signs to make a decision. He stated that he has difficulty in supporting the request.

Commissioner Bohner commented that he feels the illumination of the sign is a technical issue that can be mitigated. He said that requirements can be set with the help of staff as to the appropriate amount of illumination. He indicated that he does realize that the signs would be located near residences, but he feels they can be adjusted to be as minimally intrusive as possible. He pointed out that there is a difference in the monument sign in front of the church which is intended to display information regarding services and the proposed signage which is intended to provide information regarding school and community events and information.

Director Thompson commented that it would be appropriate to rule against the project if the Commissioners feel that such signage is simply not compatible with the area. He said that that if the Commission feels that that it may be possible to mitigate the impacts of the signs, staff can draft conditions restricting the brightness, restricting the hours during which the signs are lit, and restricting any scrolling text or motion.

Chairman Simon said that he feels a continuance would be beneficial for him to evaluate in his own mind the appropriate guidelines for such signs.

Commissioner Schlager said that he has a difficulty approving an illuminated sign in a residential area above a garage with cars driving in and out and children walking to and from school.

Commissioner Lesser said that he would want to consider further whether there are other locations that would be less obtrusive to the neighbors. He indicated that he would also like for further consideration to be given to reducing the size of the signs. He said that he also would

support a continuance.

Commissioner Schlager commented that Section 10.72020 of the Code prohibits changeable copy signs in general unless a Sign Exception is approved. He pointed out that the decision regarding this proposal can possibly set a standard regarding future projects. He indicated that he has difficulty approving a sign with illuminated lights within a neighborhood regardless of their brightness. He indicated that he would still be willing to consider the proposed signage with more limitations; however, he is more likely to deny the project.

Chairman Simon commented that it would be helpful to see pictures of examples with similar signs.

Mr. Byrnes said that they would be willing to work with staff to mitigate concerns regarding the signs.

Director Thompson pointed out that the approval of a variance or sign exception by the Commission is made very specific to the subject location so that a precedent is not set. He indicated that each request is considered on an individual basis. He indicated that the findings can be formulated so that it is clear that the Commission is specifically granting approval for the subject signs. He commented that staff will have the Traffic Engineer look at the location of the signs above the garage in terms of creating a safety hazard.

Commissioner Bohner said that a standard can be set as to the illumination that is appropriate and can be conditioned to be as minimally obtrusive as possible. He said that the intent is more for school events. He said that it is not effective on a monument sign for church and school events.

A motion was MADE and SECONDED (Lesser/Bohner) to **CONTINUE** Consideration of a Sign Exception Regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street to the meeting of April 26, 2006.

AYES:	Bohner, Lesser, Schlager, Chairman Simon
NOES:	None
ABSENT:	Savikas
ABSTAIN:	None

AT 8:55 a 5 minute recess was taken.

PUBLIC HEARINGS

CITY OF MANHATTAN BEACH
DEPARTMENT OF COMMUNITY DEVELOPMENT
STAFF REPORT

TO: Planning Commission

FROM: Richard Thompson, Director of Community Development

BY: Eric Haaland, Associate Planner

DATE: March 29, 2006

SUBJECT: Consideration of a Sign Exception regarding the Installation of Two Electronic Changeable Copy Signs Above the Entrance to the Parking Garage of a Church at 624 15th Street (American Martyrs Church)

RECOMMENDATION

Staff recommends that the Planning Commission **ACCEPT** input, **DISCUSS** the subject request, and **APPROVE OR DENY** the proposal.

APPLICANT
Absolute Sign, Inc.
4652 Katella Ave.
Los Alamitios, CA 90270

OWNER
American Martyrs Church
624 15th Street
Manhattan Beach, CA 90266

LOCATION

Location	624 15th Street, between Deegan Pl. & Laurel Ave. (See site location map).
Assessors Parcel Number	4171036040
Area District	II

BACKGROUND

The subject church facility has one existing changeable copy monument sign at its primary church building and a wall sign on 2 of its 3 secondary buildings. The subject proposal for an additional 2 new changeable copy wall signs is not permitted by the city's sign code and therefore requires Planning Commission approval of a sign exception.

DISCUSSION

The submitted plans propose 2 new 25 square-foot wall signs located on a parking structure wall facing 15th Street. The signs are both programmable electronic (LED) message cabinets with a fixed 7.5" panel across the top reading "American Martyrs Catholic Church". The sign would communicate messages to 15th Street traffic and people across the street at the church's gymnasium and school facilities regarding various events, activities, and programs. The easterly sign would face directly north and the westerly located sign would face northwest as they occupy opposite sides of an angled point in the parking structure wall. A similar electronic wall sign exists at Pacific Elementary School approximately 2 blocks away from the subject location. The sign code would permit only a monument sign with changeable copy in that example; however, public schools are not subject to city sign regulations.

Changeable copy signs differ from typical fixed-copy signs identifying a business or entity occupying a given location. Changeable copy provides more detailed messages and scheduling information that change frequently. Movie theaters, flower shops, churches, and schools often have changeable copy signs. Most of these signs have plastic letters that can be manually changed by regular employees. An example of a sign exception approved by the Planning Commission in 1993 for changeable copy is Pancho's Restaurant located at 3614 Highland Ave.

The city's sign code (MBMC Chapter 10.72) permits the one existing monument sign with changeable copy at the main church building, in addition to one maximum 20 square foot wall sign on each primary building of the church facility. The parking structure that would contain the proposed signs has previously been considered an accessory structure, rather than a primary building, since it is for parking purposes only. Changeable copy signs are generally prohibited except for the monument sign allowance for churches, schools, etc.

Applicable Sign Code Provisions:

Section 10.72.050 of the sign code provides the permitted church signs as follows:

Land Use	Sign Type	Maximum Number	Maximum Area	Height	Permitted Projection	Additional Reg' s
Public & Semipublic (Churches, schools,...)	Monument	1 double faced sign per site frontage	20 s.f. per face	6 ft.	None	(E)
	Wall	1 per primary building	20 s.f. each	Top of wall	12 inches	

Additional regulation (E)(referenced above) permits changeable copy for churches as follows:

E. Changeable copy is permitted to be incorporated within one (1) primary monument sign of a public or semipublic site.

General provision 10.72.020(E) prohibits changeable copy signs in general unless a sign exception is approved as follows:

E. The copy of all signs shall be permanently fixed in place in conformance with their corresponding sign permits unless an exception for changeable copy is provided pursuant to the regulations of this chapter.

Section 10.72.080 of the sign code provides for Planning Commission approval of sign exceptions as follows:

Section 10.72.080 Sign exceptions.

On sites where strict application of this chapter creates results inconsistent with the intent of this chapter, the Planning Commission may approve modifications to the requirements of this chapter.

Applicants shall submit copies of a proposed sign program with plans and elevations drawn to scale of all existing and proposed buildings and signs as part of the exception application. Upon receipt of a complete application the item will be placed on the next available Planning Commission agenda.

An application for a sign exception as it was applied for, or in modified form as required by the Commission, shall be approved if, on the basis of the application, plans, and materials submitted; the Commission finds that:

A. The proposed sign exception would not be detrimental to, nor adversely impact, the neighborhood or district in which the property is located. Potential impacts may include, but are not limited to, design;
B. The proposed sign exception is necessary in order that the applicant may not be deprived unreasonably in the use or enjoyment of their property;
C. The proposed sign exception is consistent with the legislative intent of this title.

In granting any such exception, the Planning Commission may impose reasonable conditions or restrictions as deemed appropriate or necessary to protect the public health, safety, and general welfare.

The general intent of the sign code, referenced above, reads as follows:

Section 10.72.010 Purpose and intent.

The purpose of signs is to provide business identification. The location, height, size, and illumination of signs are regulated in order to maintain the attractiveness and orderliness of the City' s appearance; to protect business sites from loss of prominence resulting from excessive signs, particularly pole signs, on nearby sites; to protect the public safety and welfare.

Analysis:

The proposed sign location appears to be the most central to the campus-like layout of the church facility, and the least visible to surrounding residential neighbors. The height of the church gymnasium building, and the depth of the church's school parcel reduce or eliminate visibility from homes to the north, however, some homes would have views of the signs over the school playground area. Homes with the closest view of the proposed signs are to the west along the north side of 15th Street. The westerly facing angle of the west sign allows some visibility from the fronts of neighboring properties as near as approximately 150 feet. Sign exception applications do not require noticing, however, neighboring property owners have been noticed in this case since it involves residentially zoned property. No comments have been received from neighbors regarding the application at this time.

In addition to neighbor impacts, the Planning Commission should also determine if the sign proposal would be visually detrimental to the public. The intent of the sign code includes maintaining the attractiveness and orderliness of the city's appearance, and protecting the public safety and welfare.

Staff also has a concern for motion and brightness in the proposed signs. In addition to the identified code conflicts of changeable copy, sign quantity, sign size, and signs being located on an accessory structure, the sign code also prohibits all "revolving, flashing, fluttering, spinning, or reflective signs". These motion oriented effects combined with bright internal lighting would be very visually disruptive. The flexibility provided by a programmable LED sign may have the potential to achieve these effects. The applicant has indicated that the signs will not include any of these effects; however, staff suggests that any approval of the request should specifically prohibit significant motion effects and strong lighting intensity.

CONCLUSION

The sign code permits the Planning Commission to approve a sign exception if it finds that: it would not be detrimental to the surrounding area, is necessary for reasonable use of the property, and is consistent with the intent of the sign code. Staff recommends that the Planning Commission review the proposal and determine whether the electronic signs are a reasonable method for the church to communicate information that will not be visually detrimental to neighbors and the public use of 15th Street.

Staff has provided the attached draft resolution with findings for approval incorporating the reasons discussed above, and conditions requiring reduced secondary signage and increased landscaping.

ENVIRONMENTAL DETERMINATION

Pursuant to the California Environmental Quality Act (CEQA), and the Manhattan Beach CEQA Guidelines, the subject project has been determined to be exempt (Class 1) as minor modifications to an existing facility per Section 15301 of CEQA.

ALTERNATIVES

The alternatives available to the Planning Commission include:

1. **APPROVE** the project with appropriate findings and conditions to be recorded in a minute action.

2. **DENY** the project subject to public testimony received, based upon appropriate findings to be recorded in a minute action.

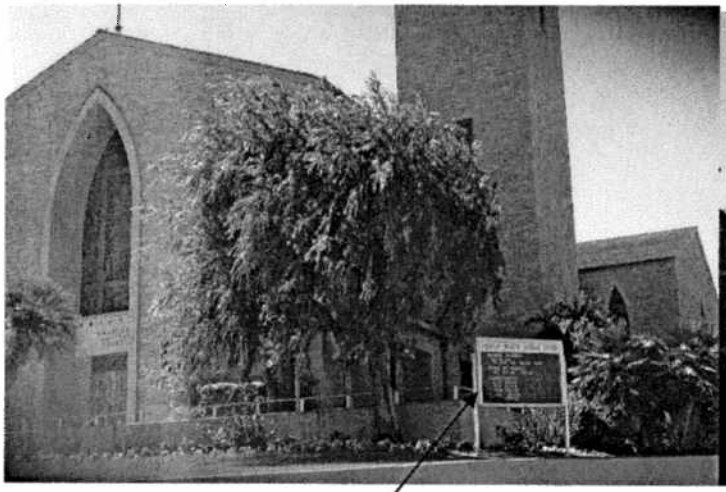
3. **DIRECT** Staff and the applicant as determined to be appropriate.

Attachments:
A. Vicinity Map
B. Sign code excerpts
Applicant Material/Plans

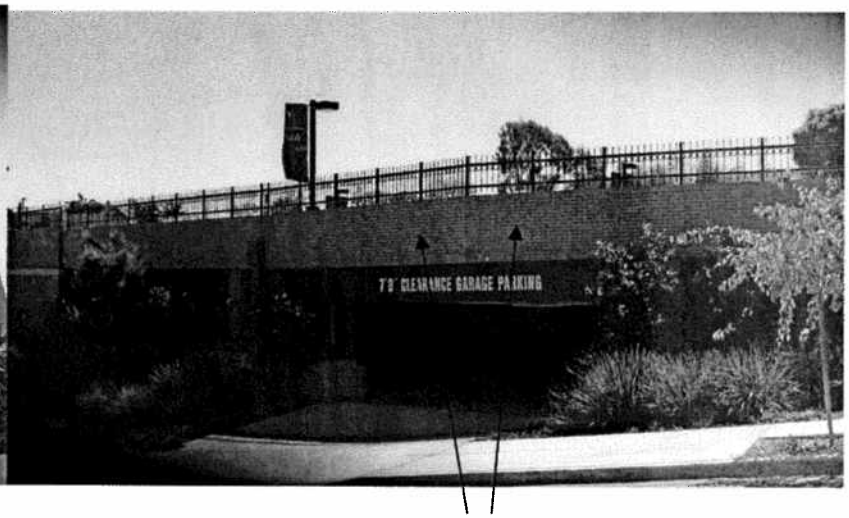
cc: , Applicant
, Property owner

Vicinity Map

American Martyr's Church – 624 15th St.



Existing Changeable Copy Sign



Proposed Electronic Changeable Copy Sign Locations

ABSOLUTE SIGN, INC.

1 March 2006

Eric Haaland
CITY OF MANHATTAN BEACH
Community Development
1400 Highland Avenue
Manhattan Beach, CA 90266

Dear Mr. Haaland:

I received an email from Rosemary Lackow indicating that our application was not complete with respect to needing a narrative explaining the projects description. I have put together answers to questions she thought would be helpful. If you find that this is incomplete or you have additional questions, please contact me and I will respond immediately.

The purpose of the sign?
To disseminate helpful and informative news within the parish and the community regarding special events, church activities and community programs.

Why the Church needs this sign?
It is needed to effectively communicate important information.

Why this location?
This location is central to the campus, which includes the Church, school, gymnasium and outdoor activity areas. Most importantly anyone coming to American Martyr's enters here to park.

Number of signs?
It is (1) double face sign, split in half

Location?
It will be located above the entrance to the lower parking garage

Size?
LED Displays – 2'-6" x 6' x 6"
Header – 7-1/2" x 6'-6"

4652 KATELLA AVENUE
LOS ALAMITOS, CA 90720

(562) 592-5838 CALIFORNIA
(800) 898-5444 NATIONWIDE
(562) 592-6198 FAX

WWW.ABSOLUTESIGN.COM
LICENSE #782551

Description of Sign:
Header Panel Copy: White Plex with 3M vinyl overlay – "logos/American Martyrs Catholic Church"
Header Panel Illumination: Fluorescent lamps
LED Display: Amber monochrome capable of (3) lines of 8.27" characters

What types of messages are expected to be displayed?
- Manhattan Beach Youth Basketball Tournament, dates and times
- Manhattan Beach Little League Opening Day Announcement, dates and times
- Holiday Mass Schedules, dates and times
- Pacific School Fashion Show Auction Announcement, dates and times
- Parish Fair Announcements, dates and times
- Time and Temperature

Will there be only words?
Yes

Will the sign have moving copy, bright or flashing lights?
No

What are the expected hours of operation?
8am – 10pm, Monday – Sunday

Will the LED be on a timer or manually switched?
The LED is controlled by a sophisticated software program that does what is programmed into it.
- It can be programmed to turn on and off automatically
- It automatically brightens or dims according to the amount of outdoor light

Are there any other changeable copy signs on other American Martyrs parcels?
No

Replies to comments regarding the code:

"Changeable copy is permitted to be incorporated within (1) primary monument sign of a public or semi-public site".
- American Martyrs does not have an area conducive to a centrally located monument sign with changeable copy
- Having an expensive LED display at ground level may be subjected to vandalism

"One wall sign is permitted per primary building for public or semi-public use". The parking structure is not the "primary building" on the parish hall/church site. It is an accessory parking garage that serves the hall and church.
- This site was chosen for; (1) its central location and (2) its unobtrusiveness. The sign will be located 200' from Laurel Avenue and 100' from Deegan Street.

"Paragraph 1 prohibits "flashing" signs"
The sign will not flash

If the sign is not to be placed parallel to and within 1 foot of the wall it would be classified as a "projecting sign"
The wall of the parking garage comes out at an angle and the sign is parallel to that wall. It will project 12" or less from the wall.

I have also included additional copies of the drawings.

Sincerely,

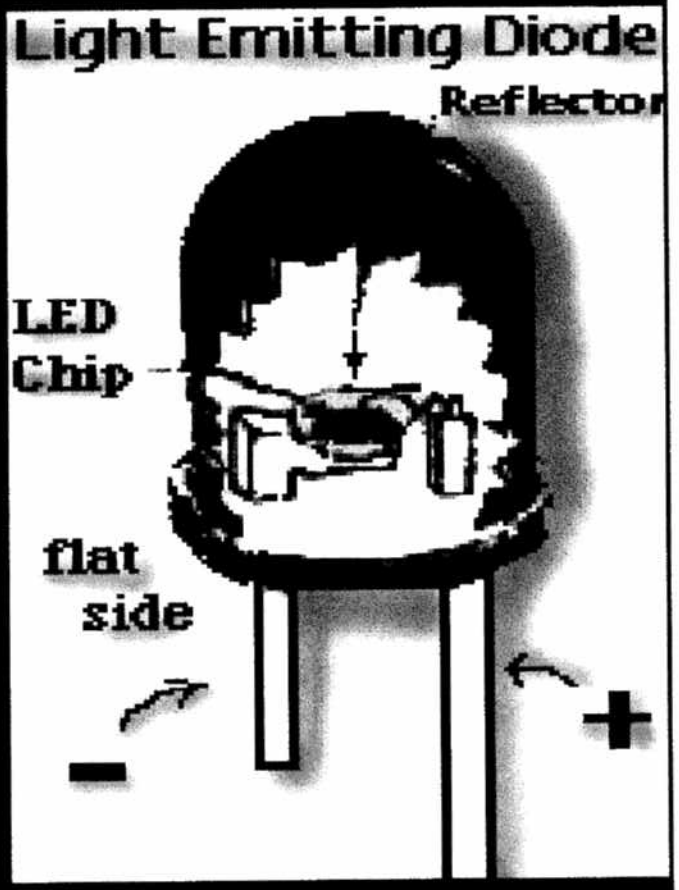
Tish Scialampo
Project Coordinator

What is an LED?

A light emitting diode (LED) is essentially a P-N junction semiconductor diode that emits a monochromatic (single color) light when operated in a forward biased direction. The basic structure of an LED consists of the die or light emitting semiconductor material, a lead reflector cup where the die is actually placed, and the encapsulation epoxy lens which surrounds and protects the die.

LEDs have greater durability:

Solid state design allows LEDs to withstand shock, vibration, temperature extremes and frequent switching on and off. Incandescent bulbs use filaments that heat up in order to emit light. Filaments are extremely fragile and are susceptible to damage from shock, vibration and temperature extremes. The life span of any incandescent lamp is deteriorated when rapidly turned on and off.



Shedding Light on Power Shortage

The LED traffic signal uses 10 watts and has a life span of about 100,000 hours (appx. 11 years). A typical 12 inch incandescent traffic signal uses 150 watts and lasts about 8,000 hours (appx.1year).

LED VS INCANDESCENT TECHNOLOGY

LED	INCANDESCENT
•No Filaments	•Filaments age and fail
•Fast On and Off	•Filaments cool slowly
•High Efficiency	•High energy
•Low Cost	•Low Efficiency
•Low Maintenance	•Higher maintenance
•Loss of LED, signal still visible	•Loss of filament, no signal visible

WHY REPLACE INCANDESCENT LIGHT BULBS WITH LED UNITS?

The new traffic lights you are seeing are made out of arrays of Light Emitting Diodes (LEDs). These are small, electronic lights that are energy efficient and have a long life. Most cities in the U.S. are in the process of replacing their incandescent traffic lights with LED units. Each LED is about the size of a pencil eraser. About 280 LEDs are used together in an array to compose one signal light module.

LED BRIGHTNESS CALCULATION
AMERICAN MARTYR'S CATHOLIC CHURCH

Calculation for brightness on an amber monochrome display with 30mm pitch and 4 LED's

Calculation Methodology

(1000mm / 30mm pitch)^2 = 1111.1 pixels M^2

(4 LED's x 1,500 mcd) / 1,000 = 6 cd per pixel

(6 cd x 1111.1 pixels M^2) = 6,666.6 NIT's

American Martyr's LED Display produces – 6,666.6 NIT's

Traffic Signal LED's (much smaller) produces – 2,000 NIT's

Display Brightness
Calculation Methodology

THIS DOCUMENT IS FOR INTERNAL USE ONLY

LED Brightness Calculations

The Brightness of an LED display is generally expressed by a numerical value in NITs. A NIT is defined as unit of illuminative brightness described as candela output per square meter (cd/M^2). The higher the number of NITs, the brighter the display. In general, 1,500 NITs provides readable text in outdoor daylight, while greyscale and outdoor video require up to 5,000 NITs for acceptable color depth.

Optec Displays, Inc. has a base criteria for all of the LED components used in the manufactured display products. These values can be used in all calculations to achieve a minimum specification for all calculations.

LED Color	Minimum mcd Rating
Red	1,500 mcd
Green	2,000 mcd
Blue	800 mcd
Amber	1,200 mcd

When working with a RGB display (full color), it is important to understand that overall brightness must take into account the ratio used to achieve *White Balance*. The RGB color ratio used by Optec Displays, Inc. is 3:6:1 respectively. Using this ratio when calculating brightness for an RGB display will ensure an accurate final value.

See the formulas and examples to the left to understand calculating brightness for all display models.

[redacted]

Base Formulas

Pixels M^2 = (1,000 mm / Pixel Pitch)^2

cd per pixel = (LED qty * mcd rating) / 1,000

NIT = cd per pixel X Pixels M^2

Example 1

Calculate brightness for a monochrome display with 36mm pitch and six red LEDs

(1,000 mm / 36 mm)^2 = 771.6 pixels M^2

(6 LEDs x 1,500 mcd) / 1,000 = 9 cd per pixel

(9 cd x 771.6 pixels M^2) = 6,944.4 NIT

Example 2

Calculate brightness for a RGB display with 20mm pitch and a pixel configuration of 2 Red, 2 Green, and 1 Blue.

The *White Balance Ratio* of 3:6:1 will determine the maximum brightness of the Red and Blue LEDs therefore using only the Green Value in the calculation will represent 60% of overall brightness. The overall brightness then can be derived from this result.

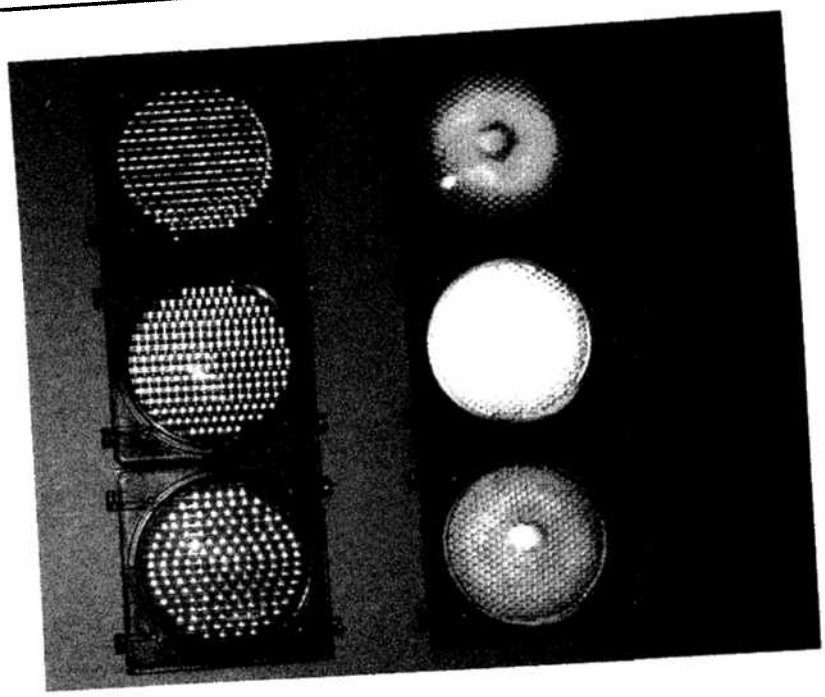
(1,000 mm / 20 mm)^2 = 2,500 pixels M^2

(2 Green x 2,000 mcd) / 1,000 = 4 cd per pixel

(4 cd x 2,500 pixels M^2) = 10,000 NIT

10,000 NIT / .6 = 16,666.6 NIT overall

TRAFFIC SIGNALS AND LIGHTING



Program Overview:

This program is geared towards improving the overall efficiency of the traffic signal & lighting systems designed and constructed by Caltrans. We are continuously working towards improvements to existing traffic signal and lighting systems. Signal & Lighting systems that we are considering has to be safe, energy efficient, low maintenance cost be safe, energy efficient, low maintenance cost and should have longer life. Keeping in mind the safety of the Maintenance personnel, the systems under development are as follows:

- Light Emitting Diodes (LED) Traffic Signals
- LED Extinguishable Message Signs
- Solar Powered LED Systems
- Solar Powered Highway Lighting Systems
- Light Pipe Tunnel Lighting Systems

LED Traffic Signal:

Caltrans has retrofitted all Red color traffic signals with Red LED traffic signal modules, the pedestrian signal "Upraised Hand" is also replaced with amber color LED module. The specifications for the following signals were completed and are now included in the July *1999 standard* specifications:

- 300mm Red LED Traffic Signal Modules
- 200mm Red LED Traffic Signal Modules
- 300mm Red LED ARROW Signal Modules
- Amber LED Pedestrian Signal "Upraised Hand" Modules

Specifications for Green, Yellow, Amber Color LED traffic signal modules and LED combo (Walking Person & Upraised Hand) pedestrian signal module can be found on the internet at following links:

- Purchase Specification LED Signal Modules (PDF File)
- Purchase Specification LED Signal Modules (Combination Pedestrian Signa File)

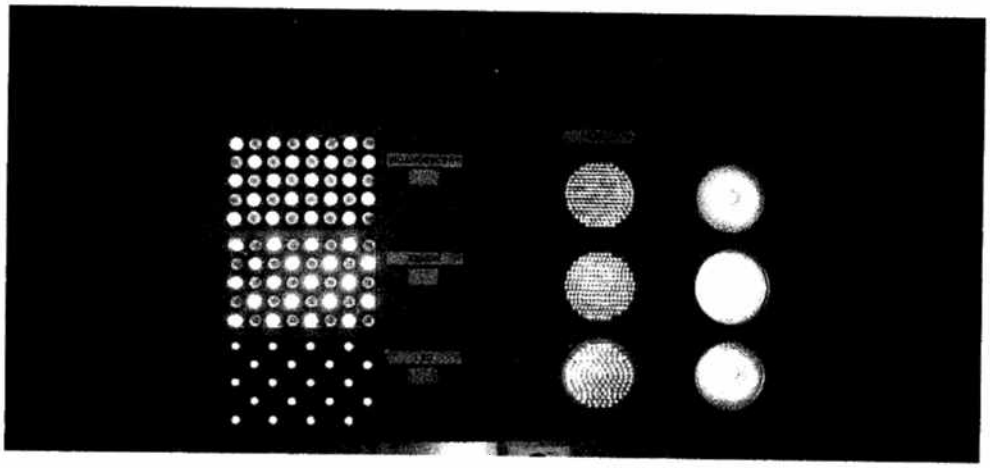
Street Lighting Materials Testing for Office of Purchasing and Contracts (OPAC):

Quality assurance testing for the state furnished highway lighting systems is performed here at the Transportation Laboratory and the following lighting products are eventually stocked at Caltrans headquarter warehouse:

- High Pressure Sodium Luminaires
- High Pressure Sodium Lamps
- Traffic Signal Lamps
- Barricade Warning Flashers
- 6.6 Amp Submersible Type Series Ballast

These items are either furnished on State contracts or are used by Maintenance for re-lamping and retrofitting the existing lighting systems.

Here is a module of Led Lighting vs. Incandescent bulb light. Available for demo at the Lab.



LEDs Are Still Popular (and Improving) after All These Years

This article reviews LED display technology that has rapidly changed over its 35 years. The origins of LEDs and their traditional applications are discussed. Some new applications for the improved technology are presented.

Introduction

In recent years, countless articles have focused on new display technologies. Typical topics have covered: the explosion of TFT color LCD panels with ever-increasing size into laptops and flat-screen monitors; PDP (plasma display panels) for high-definition TV CRT replacement; polymer LED (PLED) or organic LED (OLED) displays for the small color displays in games, cell phones, and PDAs.

This article discusses a 35-year-old display technology that itself has rapidly changed—the LED. This overview covers the origins of LEDs, their traditional applications, and how improvements in the technology have stimulated new applications.

A Brief History of LEDs

Commercial research into LED technology started in 1962, notably at Bell Labs, Hewlett-Packard® (H-P®), IBM®, Monsanto®, and RCA®. Work on gallium arsenide phosphide (GaAsP) led H-P and Monsanto to introduce the first commercial 655nm red LEDs in 1968. In 1971 H-P released the 5300A 500MHz portable frequency counter using a GaAsP LED display. LED displays flourished in the early 1970s as numeric displays in pocket calculators. For a short time, LEDs appeared in digital watches, but were soon replaced by LCDs. Meanwhile, LEDs replaced incandescent and neon lamps as status indicators, and became the standard numeric and alphanumeric display choice for instrumentation.

In the 1970s and 1980s the LED's hottest competition for consumer goods came from vacuum fluorescent displays (VFDs), whose bright blue-green display offered high intensity and high contrast when viewed through a green or blue filter. VFDs were first developed by ISE Electronic Corporation in 1967. ISE, often known by the division name of Noritake®, together with Futaba® and NEC®, offered display tubes from the late 1960s and early 1970s, starting with simple single-digit displays used in the rapidly growing desktop-calculator market. Multidigit display tubes appeared soon thereafter, reducing manufacturing cost. These tubes are possibly best remembered for their appearance in the popular Casio® pocket calculators. Later, Samsung™ started making tubes for their own consumption for use in consumer goods. In 1993, NEC sold their complete manufacturing line to ZEC in China. Today NEC, Futaba, ISE, Samsung, and ZEC produce around 95% of the world's VFD tubes production.

In the 1980s and forward, monochrome LCDs competed strongly with LEDs and VFDs for consumer devices, instrumentation, and automotive panels. With the advantage of lowest power and easy customization, LCDs became the obvious choice for battery-operated applications. Although LCDs do not emit light, there are many applications where ambient light can be guaranteed. Alternatively, the light from a couple of green, orange, or yellow LEDs can be diffused and spread behind a small (10 square centimeter) LCD with an opaque plastic molding to provide an inexpensive and pleasant backlight.

Who Manufactures LEDs?

The worldwide production of LEDs is now around 4 billion units a month. Ten years ago, Japan was the principal LED producer, and Taiwan's output was a little over 10% of the world's demand. According to the ITIS (Industrial Technology Information Service) of Taiwan, Taiwan now produces around half the world's demand from its more than 30 LED manufacturers; Japan and the USA are recorded as the next most productive LED manufacturers. Most LED manufacturers are actually assemblers and packagers, buying wafers or dice from foundries in Japan, the USA, and (more recently) Taiwan.

The C.I.E., Lumens and Candelas

This short digression on radiometric and photometric theory is useful background to the main discussion. Radiometry

measures radiant energy at all wavelengths (visible and invisible). Photometry measures apparent brightness to the human eye. The human eye 'sees' the 380nm to 740nm range of light wavelengths as the familiar color spectrum (**Figure 1**).

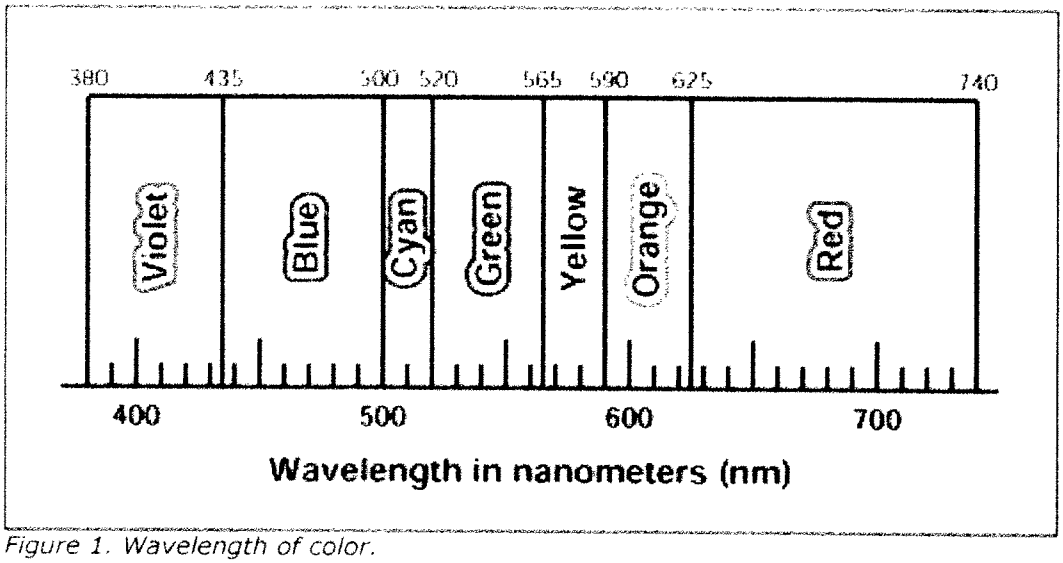


Figure 1. Wavelength of color.

The Commission Internationale de l'Eclairage (CIE) formalized standards for the measurement of light and the response of the human eye, or 'standard observer,' in the 1930s. These standards characterized the variation in eye response over the entire visible range under a variety of lighting conditions, such as daylight and night. The CIE also defined the primary colors (**Table 1**). These standards and definitions have been controversial, and other standards exist.

Table 1. CIE Definition of Colors

Color	Wavelength
Red	700nm
Green	546.1nm
Blue	435.8nm

When discussing LEDs and displays, it is important to note that the human eye response peaks roughly at green at 555nm, is sensitive to yellow, and falls off sharply toward blue at 400nm and toward red at 700nm. This can be seen in the 1931 photopic (daylight) chromaticity diagram, shown in a simplified form in **Figure 2**. The curve for scotopic (night-adapted) is quite different, peaking at about 512nm.

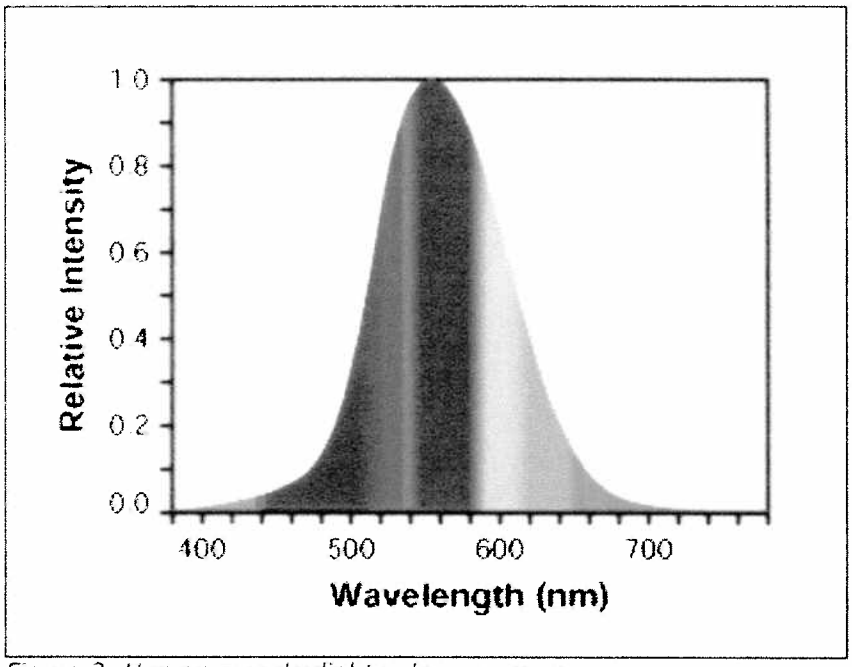


Figure 2. Human eye daylight color response.

Radiant light intensity (all wavelengths) is measured in lumens. The lumen definition states that 683 lumens of light is provided by 1 watt of monochromatic radiation at a wavelength of 555nm. Luminous intensity, in candelas (cd), results from the application of the CIE color response to the radiant flux, and provides the measurement for the visible portion of a light source. Display intensity, therefore, is described in cd or mcd to indicate the light output that is useful to the observer.

What are LEDs?

A light-emitting diode (LED) is a PN junction semiconductor diode that emits photons when forward biased. The light-emitting effect is called injection electroluminescence, and it occurs when minority carriers recombine with carriers of the opposite type in a diode's bandgap. The emitted light's wavelength varies primarily from the semiconductor materials used, because the bandgap energy varies with the semiconductor. Not all injected minority carriers recombine in a radiated manner in even a perfect crystal; nonradiated recombination occurring at defects and dislocations in seemingly identical diodes can produce wide variations in useful emissions. This means, in practice, that manufactured batches of LEDs are sorted and graded for intensity matching.

LEDs are processed in wafer form similar to silicon-integrated circuits, and broken out into dice. Chip size for visible-signal LEDs generally fall in the range of 0.18mm square to 0.36mm square (**Figure 3**). InfraRed (IR) LEDs can be larger to handle peak powers, and high-power LEDs for lighting are yet larger.

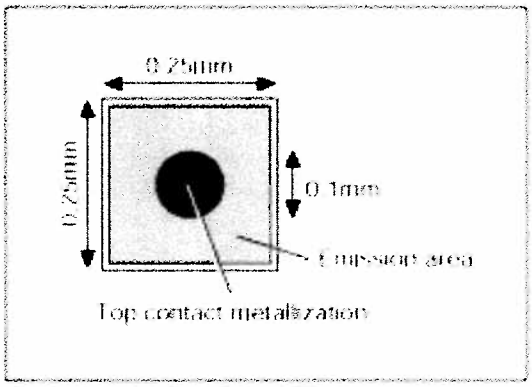


Figure 3. Typical GaP LED die.

The simplest packaged LED product is the lamp, or indicator. The basic structure of an LED indicator consists of the die, a lead frame where the die is actually placed, and the encapsulation epoxy, which surrounds and protects the die and disperses the light (**Figure 4**). The die is bonded with conductive epoxy into a recess in one half of the lead frame, called the anvil due to its shape. The recess in the anvil is shaped to project the radiated light forward. The die's top contact is wire bonded to the other lead frame terminal, the post.

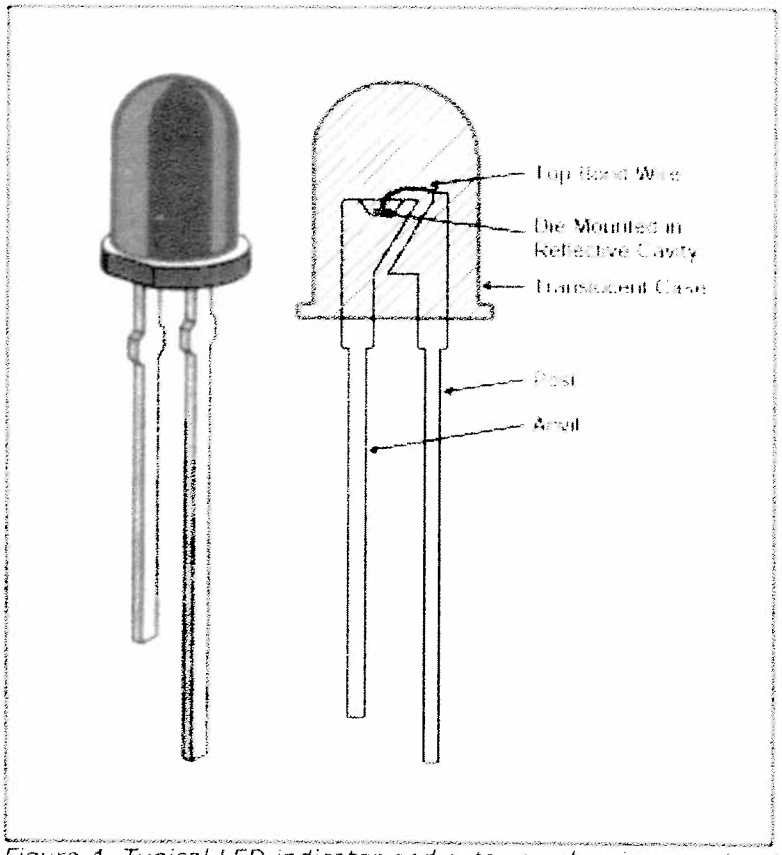


Figure 4. Typical LED indicator and cutaway showing construction.

The mechanical construction of the LED lamp determines the dispersion or radiated light pattern. A narrow radiated pattern (**Figure 5**) will appear very bright when viewed on-axis, but the viewing angle will not be very wide. The same LED die could be mounted to give a wider viewing angle, but the on-axis intensity will be reduced. This tradeoff is inherent in all LED indicators, and can be easily ignored. High-brightness LEDs with a 15° to 30° viewing angle are a good choice for an information panel directly in front of an operator; a wide-direction indicator or automotive dashboard might require an angle as wide as 120°.

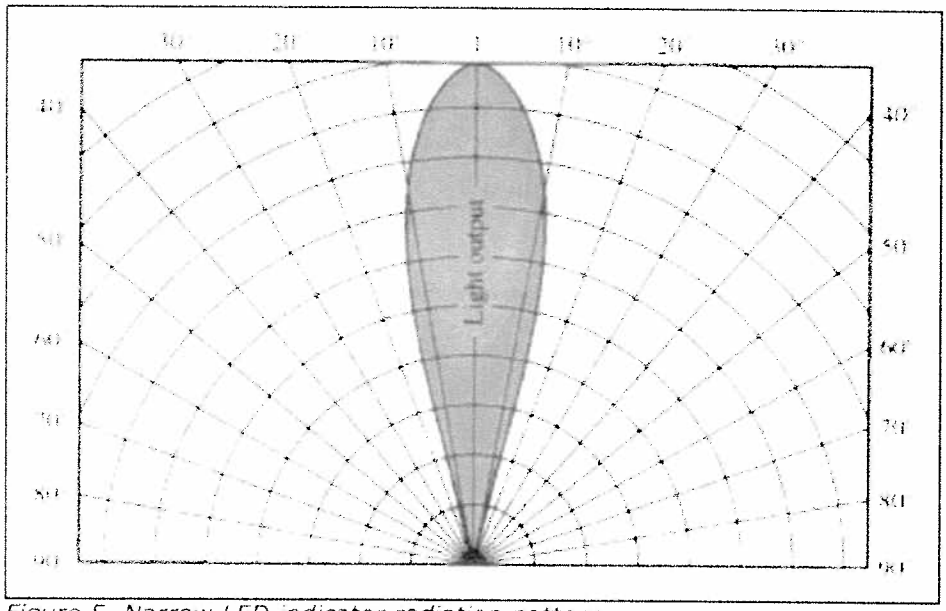


Figure 5. Narrow LED indicator radiation pattern.

LED Numeric and Alphanumeric Display Construction

The familiar 7-segment numeric display digit actually suffers from a misnomer, as there is nearly always an 8th

segment for the decimal point (DP). The less familiar 'starburst' alphanumeric displays are similarly referred to as 14-segment and 16-segment digits, again, ignoring the DP. Starburst displays provide an economical way of showing the full 26-character Roman alphabet in upper case, as well as the numerals 0 to 9. The difference between the 14-segment and the 16-segment digit types is that the top and bottom bar is split on the 16-segment digit, improving the appearance of some characters (**Figure 6**).

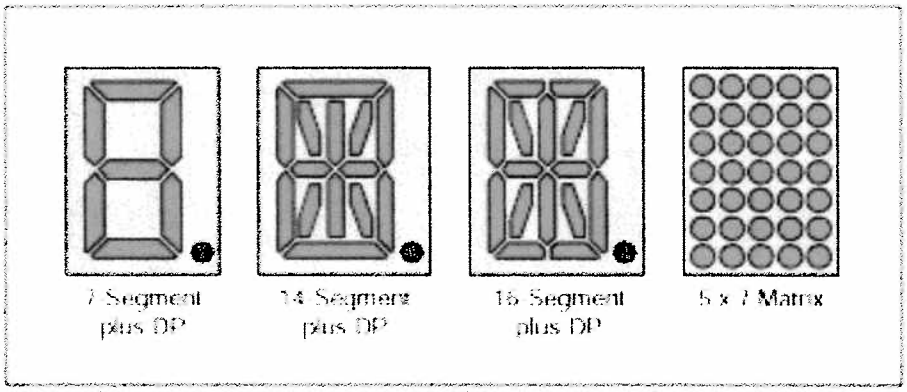


Figure 6. 7-segment, 14-segment, 16-segment, and 5 x 7 matrix digit types.

The 5 x 7 matrix is even more versatile, capable of displaying the Roman alphabet in both upper and lower case and a wide variety of symbols. The difference in the display quality is shown in **Figure 7**, which compares the characters displayed using the 5 x 7 matrix font map of the Maxim MAX6952/MAX6953 display driver with the characters displayed using the identical font map of the Maxim MAX6954/MAX6955 starburst display driver. The 5 x 7 matrix is inadequate for CJK (Chinese-Japanese-Korean) characters, and a font granularity of 12 x 12 is often cited as a minimum resolution.

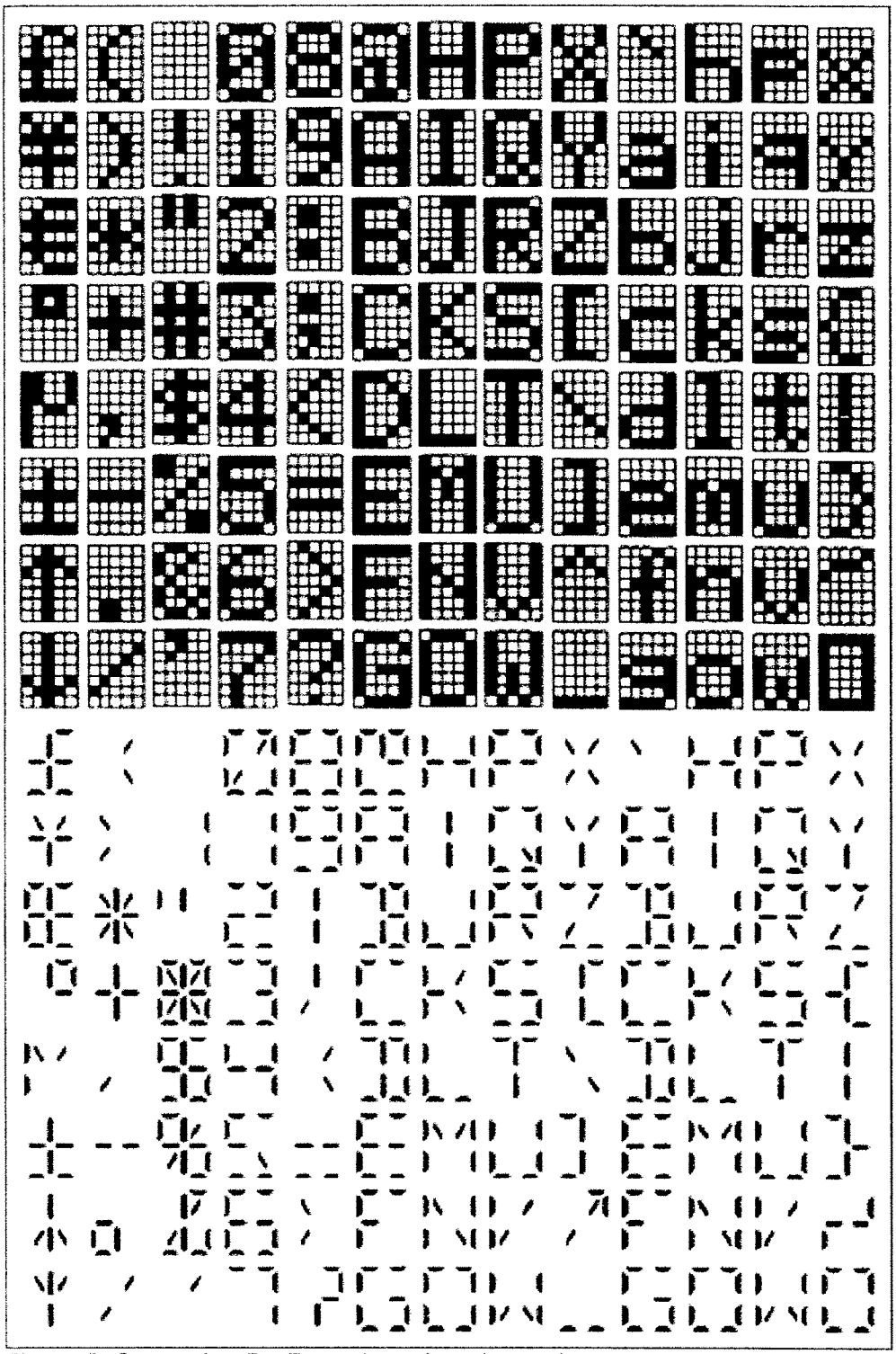


Figure 7. Comparing 5 x 7 matrix and starburst characters.

Most LED numeric and alphanumeric display digits are actually hybrids, mounting multiple LED chips in a package. Some very small display digits (for example the "bubble-top" calculator displays popular in the 1970s) are monolithic. Whether a numeric and alphanumeric display, the shape of each segment is defined by a reflector and light-pipe mounted around the LED die, not by the die itself. Small displays use one die per display segment, while large displays may use two or more dice per segment to spread the light effectively and show reasonably uniform intensity across the segment.

In the manufacturing process, the chips are mounted on either a lead frame or a PCB and wire bonded to an interconnection pattern. The dice are mounted using conductive paste, because the die substrate forms one of the two diode connections (**Figure 8**). The interconnection pattern usually connects either the anode- or the cathode-LED

chip connections together to reduce the number of pins required for the digit. As a result, displays are referred to as CA (common anode) or CC (common cathode) types, and integrated circuit display drivers will specify one type or the other (**Figure 9**).

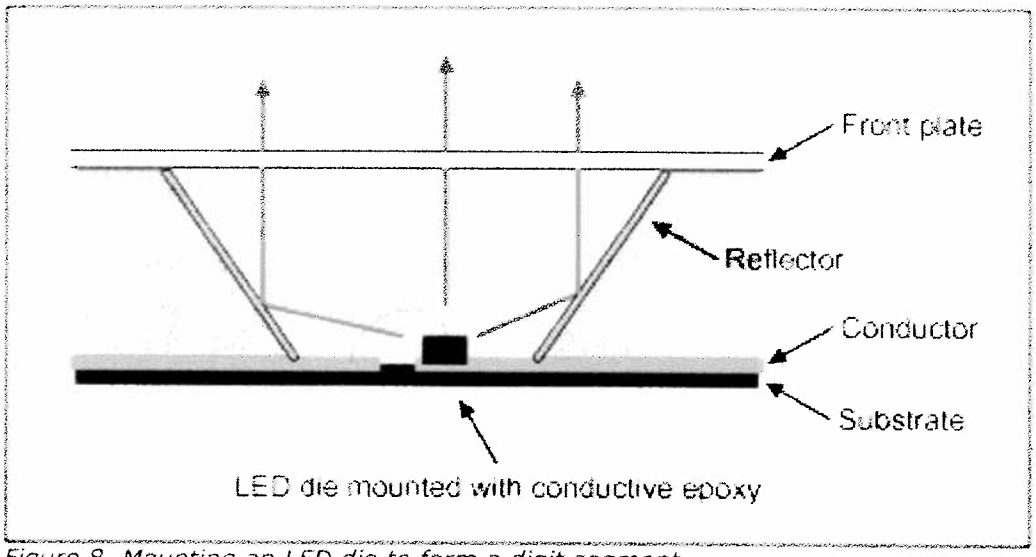


Figure 8. Mounting an LED die to form a digit segment.

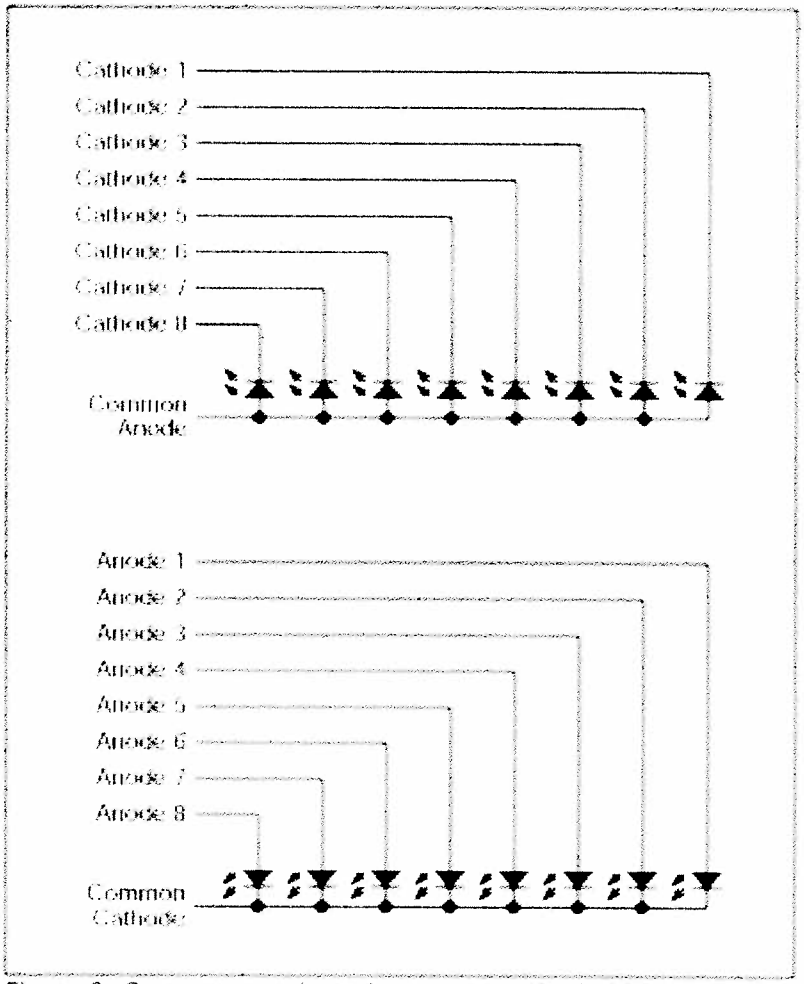


Figure 9. Common-anode and common-cathode LED digit types.

The lead-frame method of construction is similar to that used for integrated circuit manufacturing. The frame is normally etched silver-plated steel, providing good heat conduction and light reflection. The reflector channel forming the light pipe for each segment is epoxy-filled during construction, and the epoxy provides the mechanical strength

and the environmental protection to the display.

A less costly construction method uses a PCB-type substrate instead of a lead frame. Displays built this way are often referred to as 'stick' types, because the method is commonly used to build multidigit displays, for example 4-digit clock LEDs. Stick construction allows the display to be built without epoxy fill, which saves cost but leaves the display susceptible to degradation from contaminants.

LED Electrical and Optical Characteristics

The electrical behavior of LEDs is similar to other semiconductor diodes. The forward voltage is higher, and differs for the various materials used for different colors (**Figure 10**). The forward voltage rises with current and falls with temperature by about 2mV/°C. Like all semiconductors, moreover, the LED must be derated at higher operating temperatures.

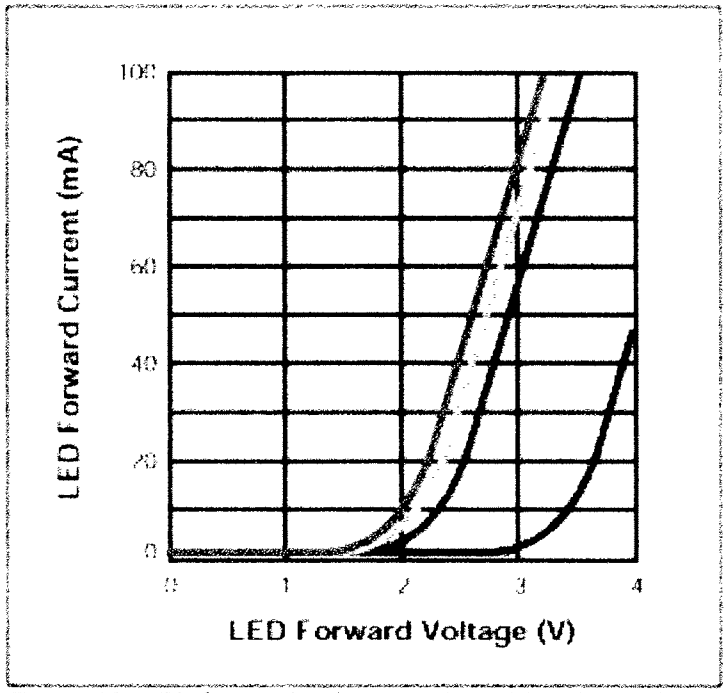


Figure 10. LED forward voltage varies with color and current.

The optical behavior of the LED varies significantly with temperature. First, the amount of light emitted by the LED lamp falls as junction temperature rises. This is because of an increase in the recombination of holes and electrons that contribute nothing to light emission. Also, the emitted wavelength changes with temperature, mainly because the semiconductor's energy gap changes with temperature.

Driving LEDs—Static Drive and Multiplex Drive

The easiest way to drive multiple LEDs, such as display digit segments, is to drive each LED separately with a resistor or current source setting the forward current. This technique is called static drive because the LED current is continuous. Static drive is useful when relatively few LEDs are driven, with the sensible limit about two 7-segment digits. High-efficiency LEDs can be driven to high brightness with 2mA, which is available from the output ports of most microcontrollers.

When driving more segments, static drive demands an larger number of drive outputs, 1 per LED. Multiplex, or pulse drive reduces the drive connections by strobing only a small number of segments (typically a complete digit) at a time. The strobing is done at a high enough repetition rate that the eye perceives continuous illumination. However, the LEDs require a higher current to compensate for the reduced duty cycle.

An advantage of pulse drive is that the human eye behaves as a partially integrating and partially peak-reading photometer. As a result, the eye perceives rapidly pulsed light somewhere between the peak and the average brightness. This means that a low-duty-cycle, high-intensity pulse of light looks brighter than a DC signal equal to the average of the pulsed signal. An advantage of multiplexed operation, therefore, is an improvement in display intensity for a given average power consumption.

The efficiency of an LED typically rises with forward current, presuming constant junction temperature. However, this is not always the case. LED data sheets should be carefully examined (and compared) when choosing the optimum peak current (**Figure 11**). Multiplying can often provide 1.5 times the light output from the average drive current of

the cycle, compared to the equivalent DC level.

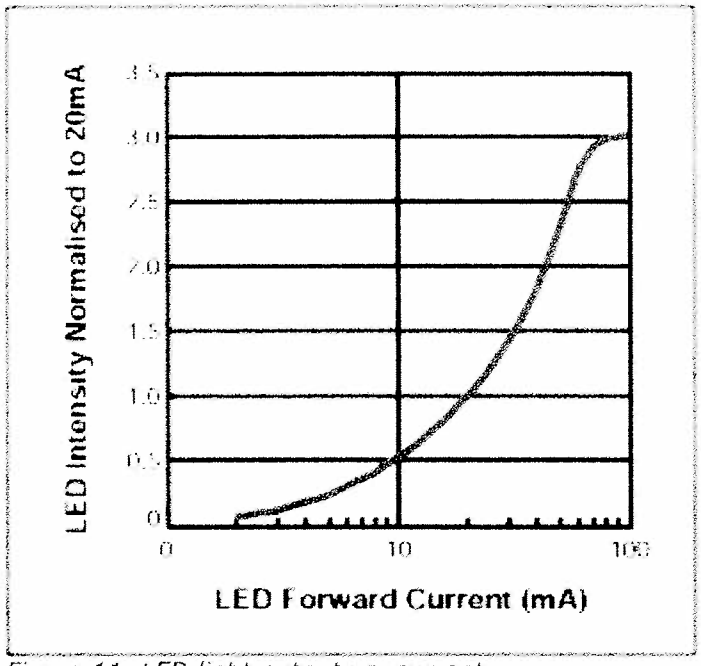


Figure 11. LED light output vs. current.

As LED drive currents increase for multiplexing, internal temperatures within the LED also increase. There is a point at which the temperature increase causes a drop in photon conversion efficiency, which, in turn, negates the effect of the increased current density through the junction. At this point, increasing drive currents can result in a small increase, no change, or even decrease in light outputs from the LED chip.

The standard connection for multiplexing LED digits uses a separate pin for each digit's common-cathode connection, while the anodes are tied together across all the digits (**Figure 12**). The number of connections required is one for every digit used, plus one for every segment within a digit. A more pin-efficient scheme relies on the fact that during the multiplex operation, only one digit-drive output is actually in use. By making the LED drive pins alternate duty between driving digits and segments, n drive pins can be used to drive n digits each with n-1 segments. The Maxim MAX6951 LED driver uses this technique to drive eight numeric digits with only nine pins (**Figure 13**).

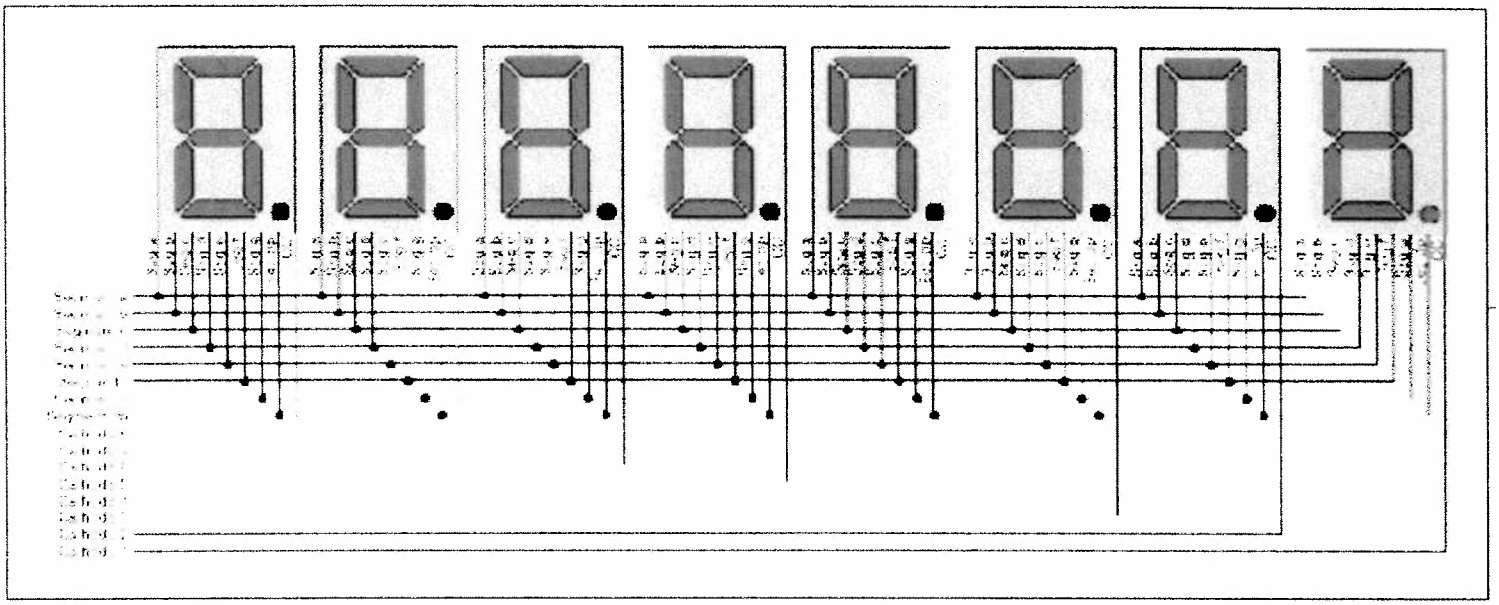


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Figure 12. Standard connections for multiplexing.

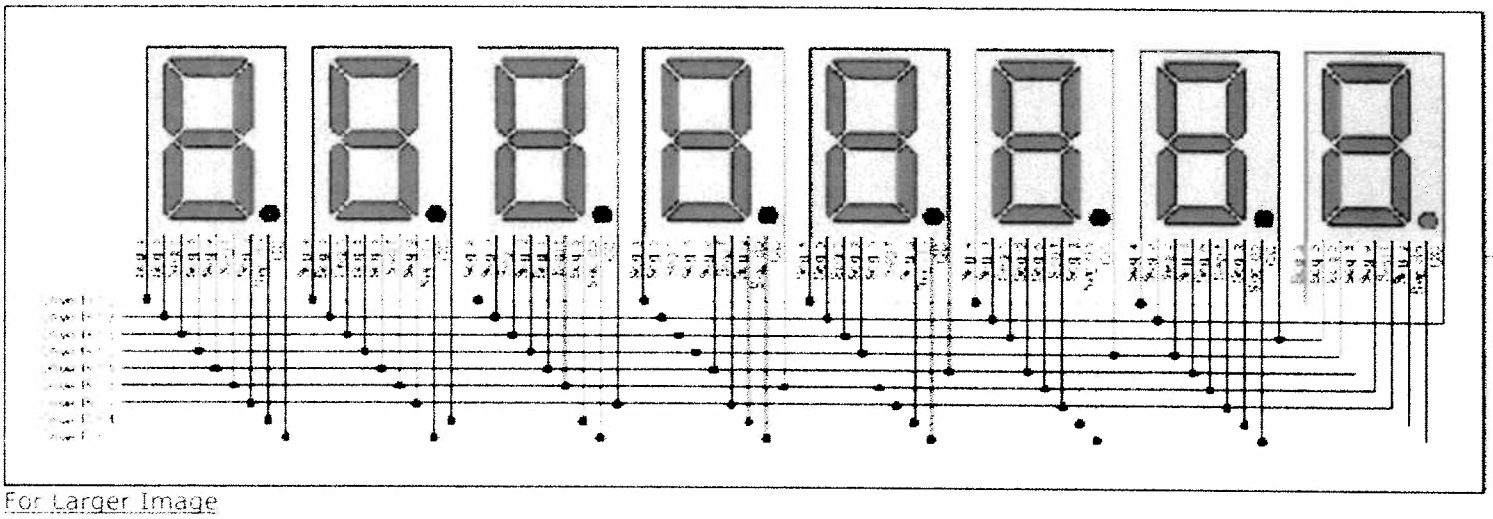

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Figure 13. Reduced pin-count multiplexing,MAX6951 connections.

LED Life Expectancy

LEDs have a MTBF (mean time between failures) usually in the range of 100,000 to over 1,000,000 hours. This is a long time for continuous operation, considering that a year is 8760 or 8784 hours. In practice, the useful measure of LED lifetime is its half-life; an LED is deemed to have reached the end of its life when the light output falls off to half the original.

When current flows through an LED junction the current flow is not uniform, resulting in small temperature differentials within the chip. These temperature differentials exert stress on the lattice, causing minute cracks to occur. These lattice defects accumulate with use, and reduce the photon conversion efficiency of the chip, thus reducing light output. The attrition rate varies from the LED material, temperature, humidity, and the forward current.

Blue and White LEDs

There are essentially two technologies for generating white light from LEDs. One way is to mount a red, a green, and a blue die very close together within a package, and mix the light outputs in the correct proportions to achieve what the human eye perceives as white light. Ignoring the technical issues of setting the correct LED drive levels, the problem with this approach, is the cost of three dice. Nonetheless, tricolor LEDs are popular for LCD backlights in consumer applications because the user can set the backlight color to any hue desired.

The most cost-effective approach, pioneered notably by Nichia®, includes a phosphor with the blue LED that absorbs some of the blue light and fluoresces in a second color to achieve a near-white light. Some early white LEDs using this technique showed a noticeable blue tinge, but the most recent developments are excellent and can be seen in full-color PDAs and cell phones.

As recent as 2000, white LEDs typically had a forward voltage drop of 4V to 4.2V. This required cell phone designers to include a step-up DC-DC regulator to increase the Li+ battery voltage (3.6V typically) to drive the LEDs. White LEDs are now being produced with only a 3V to 3.1V forward voltage drop. This allows cell phone designers to drive the LEDs directly from the battery for backlighting.

Recent Applications for LEDs

LED processes changed rapidly in the 1980s with the emergence of high-efficiency GaAlAs and ultra-efficient InGaAlP LEDs (**Table 2**). The quantum efficiency of LEDs greatly increased. All primary colors (RGB) became available, with reliability as good or better than the other display technologies. Surface-mount LEDs are now available in single-color (including white), bicolor (usually red and green), and tri-color formats (**Figure 15**). These highly efficient and ultra-bright LEDs are being designed in backlights for LCD panels, equipment panels, and indoor message boards. LEDs are also being designed as the light source for the flash on cell-phone cameras.

LEDs are increasingly designed into outdoor message boards, instead of filtered incandescent lamps, by grouping the LEDs close enough so that the light outputs merge to create a typically 25mm square pixel (**Figure 14**). These message boards, or variable message signs, are used for advertising displays and traffic signs. Companies such as Daktronics? are incorporating LEDs into stadium displays and advertising signs. In addition, LEDs are being designed into marquees/scrolling message signs, gaming machine 'toppers,' and gaming-casino progressive display signs.

Another rapidly growing market is traffic lamp replacement. Incandescent traffic lamps draw between 75W and 150W, depending on size (20cm or 30cm) and color (due to differences in the transmissivity of the red, green, and orange filters used). LED traffic lamps draw around 7W to 15W, and can be replaced every five years instead of every

six months for incandescent lamps. LED traffic lamps will save cities money, time, and the manpower required to close lanes of traffic to replace an incandescent.

Table 2. LED Processes

Light Emitting Layer	Timeline	Comments
GaAsP (Gallium arsenide phosphide)	1960s	Original low efficiency red using liquid phase epitaxy
GaP (Gallium phosphide)	1970s	High efficiency red
GaA|As (Gallium aluminum arsenide)	1980s	Single and double heterostructure processed using vapor phase epitaxy increase efficiency
InGaA|P (Indium gallium aluminum phosphide)	1990s	Metal organic vapor phase epitaxy
InGaN (Indium gallium nitride)	2000s	Ultrabright green and blue

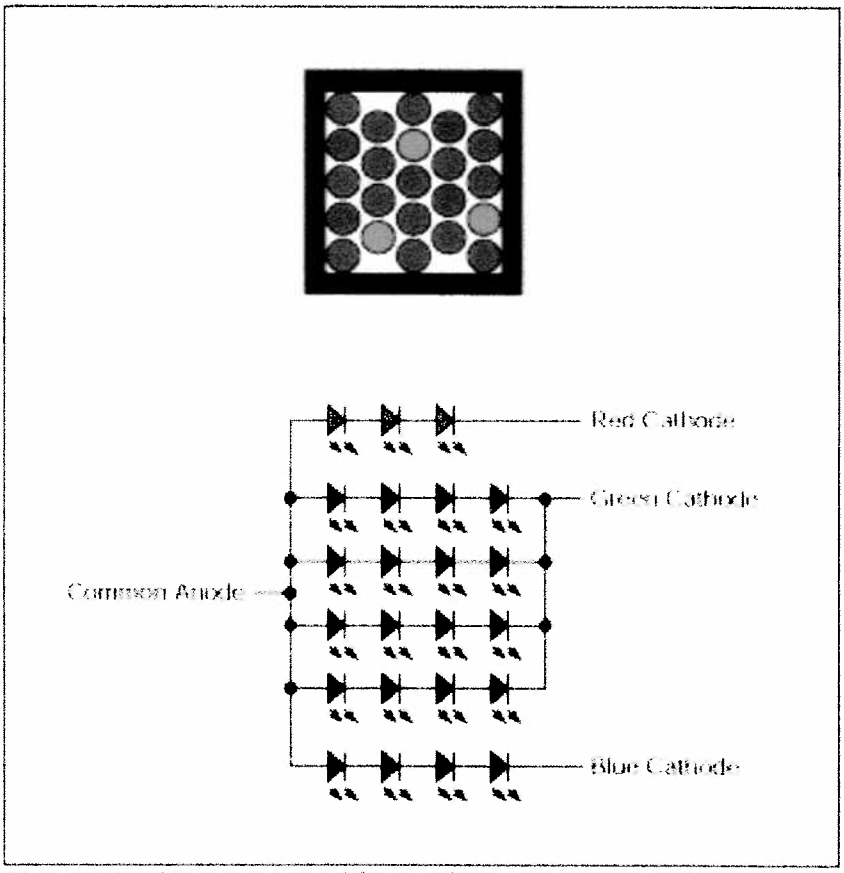

Figure 14. LED cluster pixel for outdoor message boards.

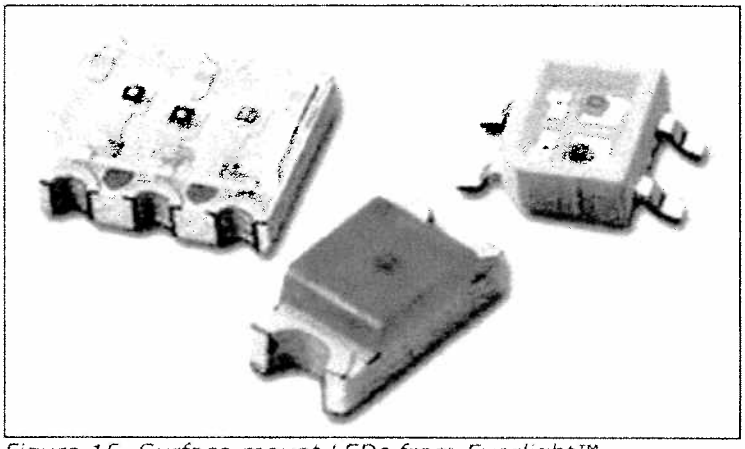

Figure 15. Surface mount LEDs from Everlight™.

Future Applications for LEDs

Current ultra-bright LEDs exceed the light output of incandescent and halogen lamps and are not subject to the maintenance requirements (a life of a few thousand hours at best) associated with filament lamps. The 100-watt incandescents typically produce 15 to 20 lumens/watt. Ultra-bright white LEDs are now producing 20 to 60 lumens/watt. Companies such as Nichia and Lumileds are designing ultra-bright LEDs capable of more uniform lighting in styles such as warm white, cool white, and commercial white. There are numerous applications for these LEDs: fluorescent light replacement, home lighting, automotive headlight and dome lighting, television backlighting and flashlights, to name a few.

Standard fluorescent lights typically produce 80 lumens/watt. As these ultra-bright LEDs near that output level, they figure to replace fluorescent bulbs in offices around the world at some point in the future. These ultra-bright LEDs pollute less and have a much longer lifetime than fluorescents.

LEDs are easily dimmed using PWM and other techniques. The goal of the LED process developers is to build a very-high-brightness white LED economical enough for domestic lighting. There is interest in high-efficiency, long-life lamps by hotels and factories because of the electricity cost and the labor cost to replace the bulbs.

Organic LEDs (OLEDs) will probably be designed into more applications: cell phones, big-screen televisions, notebook monitors, car navigation systems, and billboards. OLEDs produce brighter images, allowing customers to see their cell phone or notebook screen in direct sunlight. High brightness is achieved at low drive voltages and current densities.

Comparison of Display Technologies

For a comparison of display technologies, please refer to application note 1193, *Electronic Displays Comparison*.

A similar version of this article appeared in the October 2002 issue of Elektronik Industrie magazine.

Application Note 1883: http://www.maxim-ic.com/an1883

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For samples: http://www.maxim-ic.com/samples
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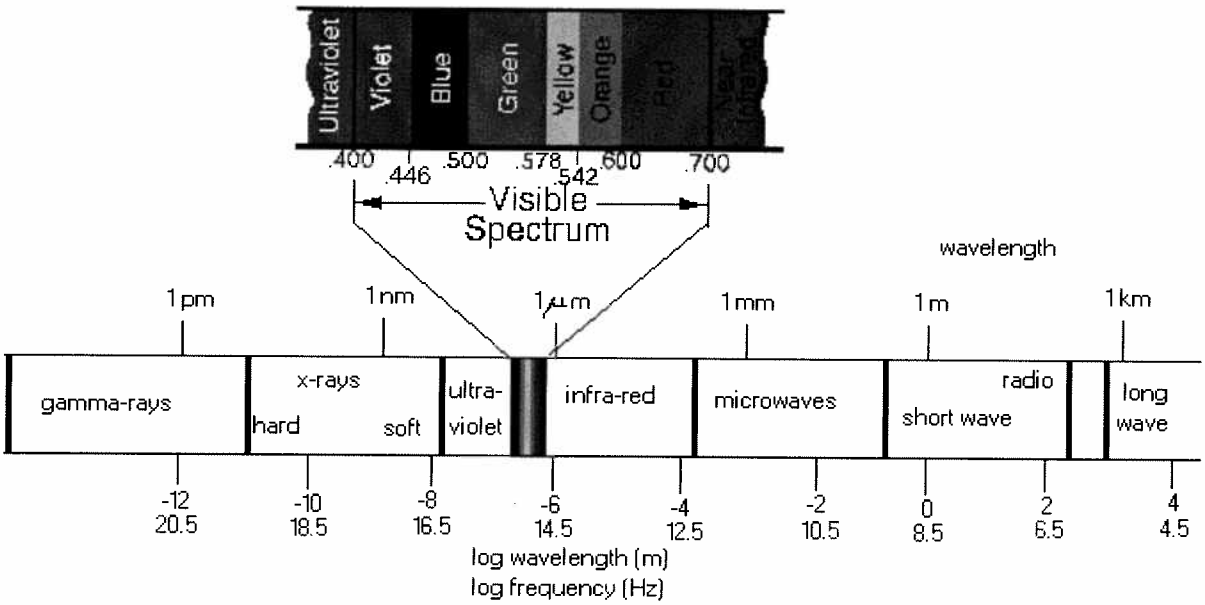
Related Parts

ICL7107:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples
ICL7117:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples
ICL7137:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples
ICM7211:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples
ICM7212:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples
ICM7218:	QuickView	-- Full (PDF) Data Sheet	
MAX139:	QuickView	-- Full (PDF) Data Sheet	-- Free Samples

The Unit of Luminous Intensity: Candela (cd)

Light is that part of the spectrum of electromagnetic radiation that the human eye can see. It lies between about 400 and 700 nanometers. All the units for measuring and defining light are based on the candela, which is the unit defining the luminous intensity from a small source, in a particular direction. This unit was originally based on the light emission from a flame.



The standard later came to be defined as the glow from molten platinum. The current definition is a radical departure from the previous formulations, because it defines light intensity in terms of the unit for radiated power in general, the watt, or joule per second. The candela is therefore no longer strictly necessary as a fundamental unit, because it is now defined in terms of a fundamental SI unit.

Historically, the engineers' unit of power, the watt, has been separated from the unit of luminous intensity, which is also a form of power, because the eye has a varying sensitivity over the visual spectrum, being relatively insensitive to blue and to red light. This radiation may make a deep impression on the viewer but, relative to yellow-green light, more watts of radiation are needed to cause a signal to reach the brain. Because of this the candela has to be defined for radiation at a single frequency. This makes the definition rather abstract, because no such light exists as something you can buy in a lamp store. The comforting symbolism of the candle has disappeared in the merciless striving for scientific precision.

Definition:
The candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12} hertz and that has a radiant intensity in that direction of 1/683 watt per steradian.

The frequency chosen is that to which the eye is most sensitive. This frequency is normally referred to as the corresponding wavelength: 555 nanometer. The wavelength varies with the medium through which the light passes, so, in the interest of precision, our relatively familiar wavelength description of light is not used in the standard.

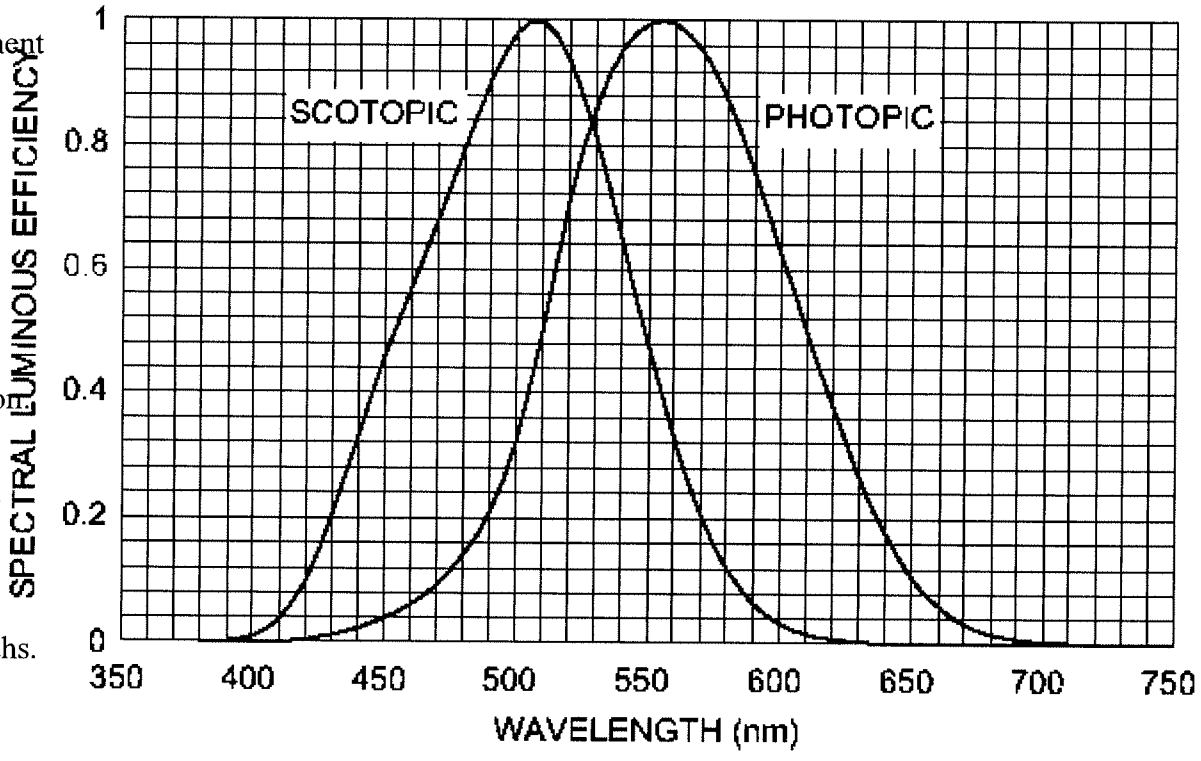
The strange choice of the number 683 is to make the value identical to that obtained with the previous version of the unit: the emission from 1 square centimeter of glowing, solidifying platinum.

The steradian is the cone of light spreading out from the source which would illuminate one square meter of the inner surface of a sphere of 1 m radius around the source.

The light intensity coming towards the observer is assumed to be reaching all angles within the enclosing steradian at the same intensity. It doesn't have to in practice: one can perfectly well measure the luminous intensity from a lighthouse beam, knowing that it actually only covers less than a hundredth of a steradian. One measures the light received by a small sensor of known area and multiplies this to give the corresponding value for one steradian.

Luminous emission is not the same as the perceived brightness of the source when you look at it. The definition implies a small source, because the energy stream from it is defined as energy within a given solid angle, independent of distance to the measuring instrument. If the source is very small, a tiny quartz halogen torch bulb for example, the brightness will appear to be intense even if its emission is one candela. If the source is, like a candle, small but not really a point, you will get an impression of a small area of light of moderate brightness, even though the light intensity is also one candela. The apparent brightness of a source when you look directly at it must not be confused with its luminous emission. The brightness of a source is measured in candela per square meter. Everything that is visible can be regarded as a light source.

V-lambda Curve



The measurement of luminous intensity from a useful light source requires extra information the relative sensitivity of the eye to different wavelengths. The luminous intensity of a "white" light source is defined by multiplying the watts emitted at each wavelength by the

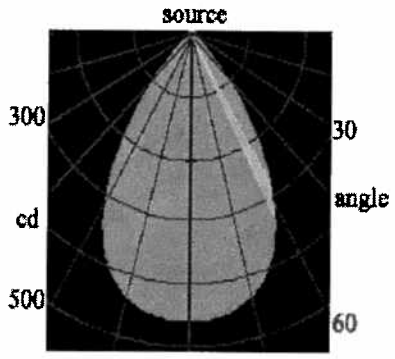
efficiency of that wavelength in exciting the eye, relative to the efficiency at 555 nm. This efficiency factor is referred to as the V-lambda curve.

This curve, obtained by averaging results from experiments with many people, has long been standardized as an essential component in the quantitative description of light. The curve defines the relationship between the human sensation of light and the physical concept of energy, which is the quantity to which measuring instruments react. The Photopic curve is the typical day light response curve and Scotopic is the typical night adjusted response curve.

The watts emitted by a light source can be measured by absorbing all the light in a perfectly black surface and measuring the heat produced. A filter corresponding to the V-lambda curve can be placed in front of the black absorber to convert the result to what the human eye and brain regard as 'brightness'. Practical measuring instruments contain filtered sensors which convert the absorbed light under the V-Lambda curve into electric current.

The lumen and the lux

A light source emits with an intensity in a given direction that is measured in candela. Manufacturers of lamps and lamp fittings issue diagrams that show the distribution of light intensity in all directions.



The pale green ray shows that this particular wide angle spot light emits 300 cd in a direction 30 degrees from its axis. The luminous intensity directly forward is 460 cd.

The candela value is independent of distance. One can think of it as the emission from the lamp, which then loses interest in what happens to the photons it has ejected. We need a new unit for the light energy moving through space in the direction of our object.

This unit of invisible light in transit is the lumen.

The official definition of the lumen, the unit of luminous flux, is:

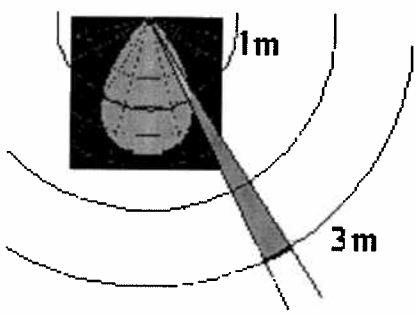
The luminous flux dF of a source of luminous intensity I (cd) in an element of solid angle dR is given by dF = IdR

In plain English: The flux from a light source is equal to the intensity in candela multiplied by the solid angle over which the light is emitted, taking account of the varying intensity in different directions.

The candela is a unit of intensity: a light source can be emitting with an intensity of one candela in all directions, or one candela in just a narrow beam. The intensity is the same but the total energy flux from the lamp, in lumens, is not the same. The output from a lamp is usually quoted in lumens, summed over all directions, together with the distribution diagram in candela, shown above.

Another quantity that is often quoted in catalogues is lumens per watt. The lumen is formally derived

from the candela, which is based on light of a single wavelength. A practical lamp of many wavelengths has the lumen output calculated from the wattage emitted as radiation multiplied by the luminous efficiency at each wavelength, as described in the section on the candela.



The diagram gives just the candela values emitted from the lamp. The designer needs to translate this into light energy falling on an object at any distance from the lamp. The energy density striking an object is given in lumens per square meter, generally known as lux.

This value can easily be calculated from the diagram for a point source. The candela value given for 60 degrees, 300, corresponds to 300 lumens streaming out into a cone of one steradian, according to the definition given above. One steradian covers one square meter on the surface of a globe of 1 meter radius. If an object were at this distance it would receive 300 lumens per square meter. To deduce the value for any other distance, just use the inverse square law. At 3 meters away from the lamp the flux on a square meter has fallen to one ninth of 300 lumens = 33. The lux value is therefore 33.

The lumen flux from a practical light source is the sum of the energy in each wavelength band, multiplied by the luminous efficiency of that wavelength. The lumen value contains no information about whether the light flux is dominated by energy in the luminously inefficient blue wavelength or, as with a tungsten lamp, is largely provided by luminously inefficient radiation at the red end of the spectrum.

Illuminance Units & Conversions

(basic units, lumens / unit area)

Quantity	Unit	Abbreviation
Luminous Intensity	candela = candlepower	cd
Illuminance	lm / sq-m	lx or lux

Use the Conversion Calculator

1 footcandle =	1 lumen per square foot
1 footcandle =	10.76 lumen / sq-m
1 footcandle =	10.76 lux
1 lumen =	1/683 watts @ 555nm
1 Lux =	1 lumen / sq-m
1 watt second =	1 joule = 10^7 ergs

Luminance Units & Conversions

(basic units, lumens/ steradian X unit area)

Quantity	Unit	Abbreviation
Luminous Flux	lumen	lm
Illuminance	lm / sq-m	lx or lux

Use the Conversion Calculator

1 lambert =	3,183 cd / sq-m
1 footlambert =	3.426 cd / sq-m
1 candela / sq-ft	10.76 cd / sq-m

Typical levels of Luminance and Illuminance

(For a luminance factor of 20%, average reflectance of a typical scene)

Outdoor	Illuminance (lux)	Luminance (cd m^{-2})
Bright sun	50K - 100K	3K - 6K
Hazy day	25K - 50K	1.5K - 3K
Cloudy bright	10K - 25K	600 - 1.5K
Cloudy dull	2K - 10K	120 - 600
Very dull	100 - 2K	6 - 120
Sunset	1 - 100	0.06 - 6
Full moon	0.01 - 0.1	0.0006 - 0.006
Starlight	0.001 - 0.001	0.000006 - 0.00006
Indoor	Illuminance (lux)	Luminance (cd m^{-2})
Operating theatre	5K - 10K	300 - 600
Shop windows	1K - 5K	60 - 300
Drawing office	300 - 500	18 - 30
Office	200 - 300	12 - 18
Living rooms	50 - 200	3 - 12
Corridors	50 - 100	3 - 6

Good street light	20	1.2
Poor street lighting	0.1	.006

At the threshold of vision the dark adapted observer can see a flash if it contains on average 90 photons at the cornea or 9 at the retina. This is equivalent to a candle at 30 miles on a clear night.

Address and Contact Information
Phone: 805 964 6701 Fax: 805 967 8590
E-Mail: eoi@electro-optical.com

k. Maximum distance between billboard faces shall be six feet, and the new billboard face shall be mounted on the same support structure as the existing billboard; and

l. The new billboard face shall serve to effectively screen the back supporting structure of the existing billboard.

G. ***District Identification Signs.*** A district identification sign is an off-site sign for the identification of a specific district or center identified in the General Plan or a business improvement or redevelopment area approved by the Council.

1. Procedure. Hearing notice shall be sent to all businesses within a district or redevelopment area, or to owners of property within 500 feet of the site, whichever is less.

2. Standards. District identification signs shall not:

a. Interfere with pedestrian or vehicular safety to the satisfaction of the Director of Transportation and Public Works;

b. Detract from the pedestrian quality of the surrounding area; or

c. Add to an over-proliferation of signs on one property or in an area.

3. Maintenance Agreement Required. The owner of the sign shall enter into an agreement with the city for funding the ongoing cleaning, maintenance, and repair of the sign subject to the approval of the Director of Transportation and Public Works.

H. ***Large screen Video Signs.***

1. Criteria for Eligibility. Large screen video signs shall be allowed only in conjunction with new construction of 5,000 square feet or more. Large screen video signs may be approved along Sunset Boulevard on parcels within Geographic Areas Three, Four, Six, or Seven in the Sunset Specific Plan or when the signs are located in the CR zone and meet all of the following criteria:

a. The site where the sign is located is designated gateway node under the General Plan.

b. The site where the sign is located is designated a light way or glow way under the Santa Monica Boulevard Master Plan.

c. The large screen video sign is a component of a special lighting concept contributing the project's gateway status as a glow way or light way as required by the Santa Monica Boulevard Master Plan.

2. Procedure. Public notice shall be provided as required by Chapter 19.48 for a Development Permit.

3. Standards. Proposed video signs shall comply with the following standards:

a. The sign shall be at least 100 square feet in screen area.

b. In the Sunset Specific Plan area, no more than four large screen videos shall be allowed.

c. If the sign is located in the CR zone, the sign shall be at least 200 feet away from any residentially zoned property and 1000 feet away from any other large screen video in West Hollywood.

d. If the sign is located in the CR zone, the sign shall be no larger than 500 square feet in

size.

e. Off-site advertising shall be limited to the large-screen video portion of the sign.

4. Time Limits and Extensions. Large screen video signs shall be installed within two years from the date of approval. The Director may, upon request before the expiration date, extend the permit one time for an additional six months in compliance with Chapter 19.62 (Permit Implementation, Time Limits, and Extensions).

5. Art Requirement. Large screen video signs approved within the Sunset Specific Plan must have arts programming to satisfy the applicant's urban art obligation. Each of these video signs shall provide a minimum of thirteen minutes of arts programming per hour, as approved by the Fine Arts Commission. Four minutes of public service announcements may be substituted for four minutes of arts programming. The arts programming on the sign shall be provided on an on-going basis for the life of the project.

I. ***Tall Wall Signs.***

1. Permit Requirement. Conditional use permit approval shall be required for use of any wall proposed to be used for tall wall signs including those that have been used for tall wall signs prior to May 2, 2001. Once a conditional use permit has been granted, the tall wall image may be changed subject to a zone clearance.

The conditional use permit shall identify the specific building wall where the sign is authorized and the specific area in which the image may be displayed. Any change to the approved image area shall require an amendment to the conditional use permit.

2. Application Requirements. An application for wall approval shall include a survey certified by a licensed surveyor verifying the size of the wall and amount of window space on the wall, and a detailed lighting plan. The application shall also include any supplemental information determined by the Director to be necessary to show that the wall can meet the standards required in sub-section 5, below.

3. Exception for Existing Tall Walls. Any location at which a tall wall was legally permitted and installed within six months prior to May 2, 2001, may continue to receive zone clearances for changes in the wall image provided that a conditional use permit application for use of the wall is submitted and found to be complete by November 2, 2001. This exception shall apply as long as a decision on the conditional use permit is pending. If a complete application has not been received by the above date, no further tall wall signs may be approved at the location except in compliance with the provisions of this section.

4. Time Limit. A zone clearance for a tall wall image shall expire six months from date of approval, after which the image must be removed. The Director may approve only one extension for an additional six months.

5. Standards. Tall wall signs shall not be approved unless all of the following standards are met:

a. A tall wall sign shall have a minimum image area of 5,000 square feet.

b. The image area may include the use of windows, provided that windows comprise no more than 15 percent of the image area and provided further that any material used to cover windows allows visibility through the windows from the building's interior.

c. The sign shall be designed and oriented to provide an unobstructed view of the minimum image area of the sign from at least one pedestrian vantage point at ground level on Sunset Boulevard, but shall not be located on a building facade facing Sunset Boulevard.

(d) Changeable copy signs, including marquee boards, changeable price signs, back-lighted signs with changeable letters, or any other changeable sign shall be permitted only under the issuance of a conditional use permit.

Sec. 10-3.2206. Illumination standards.

The following standards shall apply for all illuminated signs or for lighting used to illuminate signs. The illumination level for internally lighted or spotlighted signs shall not exceed the values shown in Tables I and II. The correlation between values shown in these tables and the lamps used to illuminate a sign shall follow the standard calculation procedures given in Section 23 of the Illumination Engineering Society Lighting Handbook.

TABLE I
Maximum Luminous Background for
Internally Illuminated Signs

Maximum Luminance in Foot Lamberts	Areas of Application
150	Facia signs in Area Districts I, II, II-A
100	Facia signs in Area Districts III and IV
300	Free standing or roof signs in Area Districts I, II, and II-A
200	Free standing or roof signs in Area Districts III and IV
400	Emergency public information signs

TABLE II
Maximum Illumination Levels for Floodlighted Signs
(Values are in Foot Candles)

Reflectance of Copy	Levels for Signs Area Districts I, II, and II-A	Levels for Signs Area Districts III and IV
Low	50	100
High	20	50

Sec. 10-3.2207. Industrial zones.

(a) Industrial sites occupying less than fifty (50) acres shall be subject to the provisions of Section 10-3.2204 of this Code.

(b) Industrial sites in excess of fifty (50) acres shall be required to submit sign plates to the Planning Commission for review and approval prior to the issuing of any sign permit.

Sec. 10-3.2208. Signs in public streets and on public right of way.

No person shall erect, place or maintain an advertising structure in, into, or upon a public street except in strict conformance with the terms and provisions of a revocable permit granted by resolution passed and adopted by the City Council. Any such resolution shall require the permittee to indemnify and hold harmless the